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Published by
Dartmouth Publishing Company Limited
Ashgate Publishing Limited
Gower House
Croft Road
Aldershot
Hants GU11 3HR
England

Ashgate Publishing Company
Old Post Road
Brookfield
Vermont 05036
USA

B1875
.D3624
1999

Ashgate website: http://www.ashgate.com

British Library Cataloguing in Publication Data
Descartes. – (The international library of critical essays
in the history of philosophy)
1. Descartes, Rene, 1596–1650
I. Sorell, Tom
194

Library of Congress Cataloging-in-Publication Data
Descartes / edited by Tom Sorell.
p. cm. — (International library of critical essays in the
history of philosophy)
Includes bibliographical references.
ISBN 1-84014-068-2 (hb)
1. Descartes, René, 1596–1650. I. Sorell, Tom. II. Series.
81875.D3624 1999
194—dc21
98-44665
CIP

ISBN 1 84014 068 2

Printed in Great Britain by Galliards, Great Yarmouth

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MAR 2 3 2001

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Acknowledgements

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Graduate Faculty of Philosophy Journal for the essay: Jean-Luc Marion (1986), 'On Descartes' Constitution of Metaphysics', *Graduate Faculty Philosophy Journal*, **11**, pp. 21–33.

History of Philosophy Quarterly for the essays: Russell Wahl (1995), 'How Can What I Perceive Be True?', *History of Philosophy Quarterly*, **12**, pp. 185–94; Edward Slowik (1996), 'Perfect Solidity: Natural Laws and the Problem of Matter in Descartes' Universe', *History of Philosophy Quarterly*, **13**, pp. 187–204; Adriaan Peperzak (1995), 'Life, Science, and Wisdom According to Descartes', *History of Philosophy Quarterly*, **12**, pp. 133–53.

International Philosophical Quarterly for the essay: Francis P. Coolidge, Jr. (1991), 'The Insufficiency of Descartes' Provisional Morality', *International Philosophical Quarterly*, **31**, pp. 275–93.

Johns Hopkins University Press for the essay: Gary Hatfield (1985), 'Descartes's *Meditations* as Cognitive Exercises', *Philosophy and Literature*, **19**, pp. 41–58.

Journal of Philosophy for the essays: Jim Stone (1993), 'Cogito Ergo Sum', *Journal of Philosophy*, **90**, pp. 462–68. Copyright © 1993 The Journal of Philosophy, Inc.; Daniel Garber (1987), 'How God Causes Motion: Descartes, Divine Sustenance, and Occasionalism', *Journal of Philosophy*, **84**, pp. 567–80. Copyright © 1987 The Journal of Philosophy, Inc.

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Kluwer Academic Publishers for the essay: Paul Ricoeur (1996), 'The Crisis of the *Cogito*', *Synthese*, **106**, pp. 57–66. Copyright © 1996 Kluwer Academic Publishers.

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Southern Journal of Philosophy for the essays: Jeffrey Tlumak (1983), 'Judgment and Understanding in Descartes's Philosophy', *Southern Journal of Philosophy*, **21**, pp. 89–99; Peter Markie (1983), 'Descartes's Theory of Judgment', *Southern Journal of Philosophy*, **21**, pp. 101–10; Daniel Garber (1983), 'Understanding Interaction: What Descartes Should Have Told Elisabeth', *Southern Journal of Philosophy*, **21**, pp. 15–32.

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Vittorio Klostermann GmbH for the essay: William R. Shea (1984), 'Descartes: Methodological Ideal and Actual Procedure', *Philosophia Naturalis*, **21**, pp. 577–89.

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The dominant approach of the series is philosophical in that the essays are primarily accounts and critiques from the perspective on the philosophical issues of the time. Some essays trace philosophical influences and elucidate the context of the major philosophical writings. Other essays offer commentary on the texts in the light of current theories of interpretation and historical understanding.

The overriding criteria for the selection of essays are their quality and importance. The essays overall are chosen to ensure a systematic coverage of all important scholarly debates but they also reflect the interests and perspectives of the individual editors which gives each volume a distinctive flavour. I am very grateful to all the editors for the enthusiasm and experience they have brought to the difficult task of selecting essays which bring out the central controversies over the interpretation and understanding of the work of the enduring figures and schools in the history of philosophy.

The International Library of Critical Essays in the History of Philosophy complements the highly successful International Research Library of Philosophy, edited by Professor John Skorupski, which now runs to over 20 volumes and is widely used throughout the world.

The series owes much to the vision and persistence of John Irwin and the great work done by Valerie Saunders, Sonia Hubbard and the Ashgate editorial team.

TOM CAMPBELL
Series Editor
Faculty of Law
The Australian National University

Introduction

The journal literature on Descartes in English is vast, and it is growing larger. The number of very able commentators is increasing as well: there are many more than can be represented in a collection of essays, even a multi-volume collection. Anyone who wants to make a manageable survey needs to discriminate somehow, and I have made use of five principles of selection. First, I have tried to reflect the increasing convergence of the history of science and the history of philosophy in recent Descartes studies. That is, I have tried to keep up with the tendency of philosophers to take greater account of the way Descartes's scientific programme drives his metaphysics. Second, where essays that are otherwise equally valuable differ in the degree to which they bring in Descartes's overall system – his conception of the way the different pieces of his philosophy go together – or differ in the degree to which they consider his writings as a whole, I have usually favoured those that take the more synoptic view. Third, I have not hesitated to include pieces that locate Descartes within a relevant intellectual history. In this connection, too, I believe that I am reflecting a growing sensitivity in the literature to the context and motivation of Descartes's ideas, and a gradual abandonment of the practice of mining the early modern philosophers for free-standing puzzles and problems that cohere well with late 20th century preoccupations. Fourth, I have looked for literature that connects straightforwardly with the standard commentaries used by teachers and students of Descartes's philosophy who are working in English. That said, the collection is less parochial than it might have been. In a few cases I have drawn on authors who usually write in French and Italian, and some of whom indicate Descartes's position in a tradition leading to Heidegger rather than to figures that are central to Anglo-American philosophy. Descartes is a pivotal figure in Western philosophy and science as a whole, and he fits into more than one intellectual tradition. The French and Italian contributors (appearing here in English) reflect that in a small way. Finally, I have tried to include less well-known essays of well-known Descartes scholars and leading essays of less prominent Descartes scholars.

Philosophy and Science

Books about Descartes or anthologies of essays, at least in the English speaking world, used to treat Descartes's metaphysics as if it were self-contained. It is now recognized[1] that the metaphysics is entangled with Descartes's scientific programme to such an extent that even such staples of a would-be pure philosophy as Cartesian dualism and the mind–body problem have to be connected with theses in Descartes's physics and explanatory psychology. In this book, the reintegration of Descartes's natural philosophy and metaphysics is perhaps most strikingly reflected in the pieces included in Parts I, VII and VIII.

Method

Part I – on Method – is a sequence of three papers in which certain received interpretations of Descartes's philosophy of science and scientific practice are strongly challenged. For example, it is commonly maintained that Descartes so admired the deductions of the geometers that he tried to reconstruct all of physics, or at least the most general parts of physics, as a set of general theorems unfolded from something like axioms, including background first principles introduced in his metaphysics. Again, it is commonly claimed that, along with Galileo, Descartes was intent on solving problems in physics by reducing them to a form in which they could engage exactly some freshly formulated mathematical laws of motion. In these ways Cartesian physics was supposed to depart markedly from scholastic pseudoscience with its qualitatively defined elements and its myriad Aristotelian formal causes and species. The first of the papers in Part I, Doren Recker's, strongly challenges any simple deductivist interpretation of Descartes's scientific work in physics, meteorology and physiology. Unless the term 'deduction' is understood to cover a whole host of ways of ordering considerations – and not just the way Euclid presented geometry – Descartes's claims about his own uses of deduction are hard to justify, and his illustrations of the right uses of his method are hard to make sense of. Recker's arguments concern not only those from the early *Regulae*, but *Le Monde* and the *Discourse and Essays*.

Just as the deductivist Descartes is less evident in Descartes's texts than in the lore about Descartes, so the mathematizing Descartes may in some respects be a creature of legend. If mathematizing is a matter of arriving at a law in the form of an equation and expressing a problem in terms of such an equation, then Descartes was no great mathematizer. He presents very few mathematical laws in his suppressed physics or in *The Principles of Philosophy*. What he does do is propose models of the shapes, and so the geometry, of the small parts of bodies and their movements to make sense of observations at the macro-level. Sometimes the simplifying assumptions that go with this modelling are importantly erroneous, as Shea demonstrates: often the ways in which causes are 'proven' are not cases of mathematical proof. Not even Descartes's rule about confining oneself to the manifestly clear is adhered to. So Descartes's method turns out not to guide his practice. As Shea points out, 'Descartes virtually identified causal explanation by imaginary mechanism with the science of mechanics' and the imaginary mechanisms were hardly ever characterized mathematically.

Recker and Shea challenge some of the standard reading of Descartes, but they agree that he is consistently anti-Aristotelian, and that his enthusiasm for unAristotelian explanatory hypotheses is constant even when his success in mathematizing problems or in strict deduction is variable. Garber wonders whether even Descartes's anti-Aristotelianism is beyond doubt. Concentrating on the *Discourse and Essays* he notes that it failed to disconcert certain Aristotelian contemporaries, Morin and Fromondus, who corresponded with Descartes about his scientific findings, and that Descartes himself played down his differences with these readers. Although it is possible to question Descartes's sincerity in these exchanges, or to read them so that they cohere with his having broken with Aristotle,[2] Garber's interpretation reminds us that Descartes was much more influenced by the intellectual milieu of his time than the story of his creating modern philosophy single-handed would suggest.

It is one thing for Descartes's methodological precepts to be taken together with his positive doctrines in natural science. What about his metaphysical claims? These are supposed to belong to a first philosophy, and so to be intelligible without knowledge of the sciences that the first philosophy is supposed to support. But it is hard to keep the metaphysics apart from the empirical physics or psychology. An important reason is that metaphysics and the sciences have an overlapping subject matter in human beings. A human being is a union of an immaterial and metaphysical thing – a mind – with a material thing – the body – some of whose behaviour obeys the laws of physics. The union is in force while we are alive, and the vital functions are open in part to mechanical explanation. But much of human behaviour is connected with thought, understanding, and the will – things that metaphysics studies. To make matters more complicated still, some phenomena in both empirical psychology and metaphysics can only be grasped properly from a first person perspective. Thus, first person experience of embodiment and action is the best way of grasping what mind–body union is, according to Descartes; and first person application of the method of doubt is supposed to be a preliminary to discovering the truth of the *cogito* and of the existence of a benign creator of the mind. But the I that uses the internal senses to grasp union is not the de-sensed I who discovers the *cogito*. The Is are different, though it is natural to identify them.

Mind and Body

Part VII – on Mind and Body – attests to the difficulty of disentangling, and maintaining coherence among, the empirical and metaphysical claims Descartes makes about human beings. The common preoccupation of all of these essays is the so-called 'scandal' of Cartesian interactionism. Descartes is committed to holding (1) that matter and mind are fundamentally different – that their essences have nothing in common – (2) that minds and bodies interact causally, and (3) that in order to stand in causal relations to one another, things have to be similar in some sense. Jolley thinks that (3) needs to be read very strictly to make (1) to (3) inconsistent, and to that extent the 'scandal' is contrived. Nevertheless, he recognizes that other problems arise from principles that Descartes uses, most famously in Meditation Three, about degrees of reality in causes and effects. The problems are formidable in the case of Descartes's quasi-empirical theory of sensation. Here, too, he thinks, the problems can be met.

In the paper that follows Jolley's, Margaret Wilson reopens the question of whether Descartes's theory of sensation makes it difficult to dispel the scandal of interactionism. She concludes that at least one model used in that theory does make it difficult to dispel the scandal, and that apologists for Descartes's interactionism have not taken into account all of the textual evidence that goes against them. Despite that, she inclines in the same direction as Jolley, doubting that the heterogeneity of mind and matter is enough to generate a genuine incoherence.

Garber's paper is concerned with interactions *from* mind to body rather than the other way round, and he is concerned with whether Descartes's comments on mind–body interactions in his letters to Elizabeth are compatible with his physics. His answer is that they are not compatible, and he proposes another answer which would have made them compatible. In a way Garber joins Jolley and Wilson in finding a non-scandalous doctrine about interaction; but he brings a stronger sense than they do of the larger physical programme to which the doctrine of mind and body was supposed to contribute. Descartes's metaphysics was supposed to prepare the ground for the release of the physics Descartes held back in the treatise

(*Le Monde*) that he suppressed in 1633: if some of the metaphysical doctrines turn out to be inconsistent with the laws of motion of the physics, then that, from a certain point of view, is more serious than any subtle, internal incoherence in the metaphysics itself. If the metaphysics makes one balk at the laws of motion of the physics, the whole purpose of the detour into metaphysics after 1637 is defeated. Garber thinks that there was a way Descartes could have accomplished it all, albeit with some remaining tensions in the metaphysical part of his system.

In the final contribution to Part VII, McLaughlin takes issue with Garber and upholds the interpretation put forward by one of Descartes's celebrated successors: Leibniz. However, the exact statement of the incoherent interactionism that Descartes may or may not be committed to is rather different from what one finds in Jolley and Wilson. This time the inconsistent triad is supposed to consist of:

1. The material (corporeal) world is causally closed.
2. The mind is immaterial.
3. The mind acts upon the body (that is, makes a difference to the material world).

Leibniz claimed that Descartes made a mistake in physics – he failed to see that the total quantity of motion *and* its total direction is conserved – and therefore made the mistake of thinking that the mind could change the direction of a body.

Matter and Motion

Part VIII continues the discussion of connections between Descartes's metaphysics and Descartes's physics. Roger Woolhouse's paper begins by focusing on a familiar question in Descartes commentary – about the relation between Descartes's thesis that matter is only extension and Descartes's denial of a vacuum. It has often been supposed that the denial is a corollary of the thesis. In a very careful reading of sections 4 to 19 of Part II of *The Principles of Philosophy*, Woolhouse challenges this interpretation. '[S]ince the discussion of sections 10 to 15, about the relation between space and body, is completely independent of whether matter is [just extension], … the question … about the vacuum is also quite independent of what there is to matter.' Woolhouse traces the misreading to the idea that Descartes is accepting rather than challenging the idea that space can conceivably exist without matter. Finally, Woolhouse reminds us that for Descartes matter is *at least* extension as well as *at most* extension, and he points out the *at least* claim gets its point from Descartes's rejection of Aristotelian prime matter.

The concept of perfect solidity has often been taken to be introduced into Descartes's physics in order to explain impact phenomena. Slowick argues that the concept is better interpreted more generally to cover the composition of bodies – independent of impacts. He shows that perfect solidity is a key concept in Descartes's physics. Among other things, it is used to stifle doubts about extension being the true nature of body.

Nonnoi presents Descartes's famous denial of a vacuum against the background of Mersenne's reactions to Galileo, and Descartes's reaction to Mersenne's reaction. At the heart of the matter is this dilemma: 'either admit, as Galileo had, the creation of a vacuum, albeit for the shortest fragment of time, or give up the postulate, no less fundamental, according to which motion takes place in time'. Descartes denied the vacuum, but at the cost of postulating a mysterious subtle matter. Nonnoi successfully explains the forces, both intellectual and contextual, that made Descartes perhaps unfairly critical of Galileo. More importantly, perhaps, he calls attention to passages in *Le Monde* which indicate that the question of the existence of the vacuum was not entirely a matter of whether a vacuum had to be invoked to account for observations.

Metaphysics

All but one of the remaining parts in this collection are concerned with Descartes's metaphysics. For the most part the papers take up questions that arise from the internal detail of the *Meditations*. The answers, too, are mostly taken from the *Meditations, Objections and Replies* and Descartes's Correspondence. Descartes's wider programme in the sciences is less evident, and his scientific works are relegated to the background. Some of the papers – on Cartesian doubt, on Descartes's theory of ideas and judgement, on the *cogito* – take up questions of perennial interest to Descartes specialists, but they have been chosen to reflect the new directions the literature has taken in the 1980s and 1990s. There is greater sensitivity to intellectual context and tradition (see especially Garber and Menn); to the literary properties of Descartes's *Meditations* (Hatfield), and to the internal *detail* of the text (Voss and Field) than is evident in much of the literature in English of earlier decades. But the 'in English' is necessary here. Descartes scholarship in France has always been meticulous about all of these things, and one way of summarising the progress that has been made in the 1980s and 1990s is by saying that essays in English have moved in the direction of those that routinely appear in French.

External Questions

One sign of the growing together of French and English language work is the appearance in English translation of the writings of French commentators. Another is the number of references in English language literature to these commentators.[3] Jean-Luc Marion is one of those commentators.[4] He is in charge of the famous *Equipe Descartes* at the Centre National de Recherche Scientifique in Paris, and he is highly regarded in France as a philosopher in his own right. His essay on the constitution of Descartes's metaphysics is one of a pair of essays by French philosophers I have put in Part II – 'Metaphysics and Cartesian metaphysics'. Both essays try to identify what is distinctive of Descartes's metaphysics in the wider history of metaphysics.

Marion asks in what sense Descartes has a metaphysics at all – at least as traditional metaphysics was understood by Descartes's contemporaries – and answers that it is metaphysics in a sense proposed by Heidegger. It is 'onto-theo-logy' of two kinds, and appreciating as much, Marion says in two intriguing closing paragraphs, may help organize the story we tell about philosophy immediately after Descartes. Marion's article explains what 'onto-theo-logy' might mean in relation to Descartes, and how Descartes innovates in metaphysics in relation to other metaphysicians of his time and earlier.

Ricoeur, one of the leading philosophers in France today, is not known as a Descartes specialist. But his essay also locates Descartes in relation to the legacy of Descartes's metaphysics, especially as seen from a late 20th century French vantage point. He calls attention to the tension between the two first principles of Descartes's metaphysics. On the one hand, there is the *cogito*, which conjures a truth about existence out of subjectivity alone. On the other hand, there is God's existence which, once introduced, appears to usurp the position the *cogito* has as first principle. The tension is a first indication of the tension between Self and Other so important to subsequent philosophy, at least subsequent philosophy in France and Germany. It is a tension that reappears in the paper by Peperzak in the section on Cartesian ethics.

Internal Questions

Parts III, IV, V and VI take up topics that are utterly central to Descartes's metaphysics and to the text of the *Meditations* in particular.

Meditation and Doubt

Part III opens with Hatfield's case for taking seriously the literary form of the *Meditations*. The *Meditations* was modelled on a certain genre of devotional literature, suitable for being taken on retreats by the Catholic faithful. At first sight the point of this format seems to be explained by Descartes's wish to make friends among the Churchmen as a preliminary to releasing his suppressed physics. Officially, the *Meditations* was supposed to have a role in convincing doubters of the immortality of the soul and of the existence of God. Descartes tells the reader that his work answers a Papal call for a consideration that would bolster the Catholic faith. But Hatfield thinks the devotional genre is important to more than erecting a religious facade for Descartes's scientific work. Getting the message of the *Meditations*, Hatfield claims, depends on being prepared to be illuminated by certain ideas and pieces of reasoning. Things dawn on one; points made tentatively early on are solidified later; things that are difficult to get one's mind round become more tractable the more the reflections of the entire work are allowed to unfold. Again, it is crucial to the understanding of the *Meditations* that one turns away from the senses and brings into operation the intellect with its special aptitudes for intuition and demonstration. This locates the *Meditations* in an Augustinian tradition rather than in a Thomist one. Of course, in the *Meditations*, the intellect is applied to more than its own nature and existence and the dependence of that nature and existence on God's: it is also applied to the question of the nature of matter. This is where the bearing of the metaphysics on physics is at its clearest, and also where what is unorthodox in Descartes's version of the devotional form is most evident.

An important means of detaching the intellect from the senses is the Doubt in the First Meditation. The effect of the Doubt is compared by Descartes himself with emptying the mind, a figure we ought to find natural if we take to heart the analogies between Descartes's meditative exercises and others. One controversial and central claim of Wolterstorff's discussion of Cartesian Doubt is that the mind is not emptied in the way many commentators claim. Descartes does not exactly get rid of all his sense-based beliefs about the external world, including the beliefs he acquired at La Fleche when he was taught traditional physics. What happens is that he tries to lose a belief about those beliefs, namely that they amount to *scientia* – true and evident knowledge. This loss of a meta-belief prepares the ground for acquiring truths in a way that does make them *scientia*, namely by intuition and demonstration. Wolterstorff considers whether there is a tension between the mechanics of detaching oneself from one's old beliefs and acquiring *scientia*, and also whether acquiring *scientia* squares with precepts about being careful with using the judgement in Meditation Four.

In an essay that conflicts somewhat with Wolterstorff's, Voss argues that the kind of certainty associated with *scientia* is not demanded for reaching acceptable conclusions within Cartesian natural science. Metaphysical certainty – the sort that answers the worry that we might be deeply defective intellectually – although it gives us a reason for thinking that we can get on with such sciences as physics and medicine, does not necessarily have to attend the hypotheses we make in physics or in medicine. Moral or practical certainty is enough, the same certainty that suffices in practical life. This does not mean that the quest for metaphysical certainty is unimportant to Descartes, only that it is not demanded everywhere in theoretical enquiry. Voss sums it up well in a passage about the value of scientific belief for Descartes. 'Such belief may be worthwhile for its own sake, as an intrinsic good, and it may be worthwhile instrumentally, as the foundation for medicine, mechanics and morals. Metaphysical certainty is the right standard for measuring its intrinsic value. And moral certainty is the right standard for measuring its instrumental value.'

The Cogito

One focus of Descartes literature in earlier decades was the question of whether 'I am thinking, therefore I am' is an inference. This question is still asked, but the essays in Part IV indicate that behind it is another: what makes for the cogito's undeniability or incorrigibility or indubitability? Stone thinks the answer is to do with the way one fact can be constituted by another. One's existence can be constituted by one's thinking a certain thought. This reading denies that the *cogito* is an inference, in the sense of an act of drawing a conclusion from a distinct premiss or premisses. But it also does not trace the special undeniability of the *cogito* to its being a certain kind of intellectual performance. In a famous essay published in 1962,[5] Hintikka proposed that the performative aspect of the *cogito* was crucial. According to Hintikka, a sort of pragmatic contradiction arises if one thinks the thought 'I am thinking' and yet tries to doubt 'I exist'. This pragmatic contradiction explains the undeniability of the *cogito*, according to Hintikka, and not the arrangement of terms in an incompletely expressed syllogism. Stone's reading clashes with Hintikka's, since the 'constitutes' relation is semantic, rather than pragmatic; what explains the undeniability for Stone is something about what makes it *true* that 'I exist'.

Hintikka's 'Cogito, Ergo Quis Est?' shows him still maintaining the reading he gave in 1962, but going on to consider the sequel of the *cogito* in Meditation Two. For Descartes goes on from intuiting that he exists if he is thinking to concluding, tentatively in Meditation Two, that he is a thinking thing. How does he get to even that tentative conclusion? Hintikka spends most of his time on the related question of what the tentative conclusion actually is and why it is only tentative. His answer is that the *cogito* is irreducibly thought out from a first-person perspective and warrants no reasoning to the existence of a publicly identified entity. In the same way, answers to the question 'What am I?' are constrained by the first-person perspective and the power of the doubt to exclude from consideration everything in time but what is presented to the self in the immediate present. Accordingly, the conclusion that he is a thinking thing is as evanescent as the *cogito* itself: certain only at times when it is being intuited. It takes the proof of God's existence in Meditation Three to make the conclusion about the nature of the human self reliable at times even when it is not being intuited, and generalizable to selves other than 'me'. It is the same for the *cogito* itself. Once God's existence is proved there is a warrant for 'Everybody who thinks, exists'. In an interesting tailpiece to his essay, Hintikka suggests that once that non-perspectival version of the *cogito* is assertible, then so can the *cogito* be regarded as an inference, with 'Everybody who thinks, exists' as major premiss. This means that when first hit upon in Meditation Two the *cogito* is not an inference, but that with material warranted later it can be. This is a pattern one also finds with clarity and distinctness. Before Meditation Three certain propositions are clear and distinct and cannot but be regarded as true when entertained, but it cannot yet be asserted that since all clear and distinct propositions are true, this one is. After Meditation Three that syllogism does become available.

Ideas, Truth, Judgement

There are notorious obscurities in the detail of the *Meditations* as the self passes through the Doubt to God and the possibility of *scientia*. Part V tries to throw light on these dark places in the text. Russell Wahl runs through different ways of understanding what is supposed to be before the Doubter's mind as he tries to get beyond the Doubt. Are the relevant objects of thought propositional or are they more like terms or the referents of terms? If the latter, can the relevant objects of thought be clear and distinct and therefore true, since terms have no truth-values? Or are objects of thought both propositional *and* term-like? Many of these questions arise from Descartes's talk of 'ideas'. When referring to ideas Descartes could talk about their truth and their reality without apparently supposing these were very different. Wahl thinks that in the course of the *Meditations* Descartes's enquirer has natures in mind, and that these straddle the term–proposition distinction. The rule about clarity and distinctness is a rule about which perceptions of natures to trust.

Richard Field's paper on material falsity comes at Descartes's theory of ideas from a different direction. Materially false ideas somehow misrepresent what they are ideas of, and the unwary may judge the things to be as the ideas indicate. For instance, ideas about the colours and temperatures of things may be a basis for believing in sensible forms in Aristotle's sense. Since there *are* no sensible forms, according to Descartes, the ideas are materially false. On the other hand, the ideas have content that is not simply made up, and that has 'objective being'. Field suggests that what makes ideas of colours and temperatures particularly slippery is that they register as qualities, and therefore are easy to think of as qualities *of* things in the sense of qualities *in* things or *of bodies*.

When people get the wrong idea about colours or about the nature of cold or heat, they are not at the mercy of their ideas, according to Descartes. Materially false ideas may be more likely to lead to wrong conclusions than other ideas, but they do not lead to those conclusions on their own. *People* reach the wrong conclusions, misusing their will by misusing their judgement. That is a message of Meditation Four. Tlumak investigates Descartes's theory of judgement, finds it coherent, but wonders whether a volitional theory is necessary for

Descartes's metaphysical purposes. Markie, in a reply to Tlumak, sees more to question or criticise in Descartes than Tlumak does. He wonders what Descartes's thesis that the will is unlimited can mean if it doesn't imply the implausibility that we can decide to believe something in the face of the evidence. He wonders whether Descartes's view of the scope of compelled belief squares with his views about the dependence of belief on the will through judgement. Markie also disputes Tlumak's claim that Descartes's theory of judgement is needed to support Descartes's non-externalist foundationalism. The exchange between Markie and Tlumak brings into focus many areas of difficulty in the line of thought stretching from the beginning of Meditation Three to the end of Meditation Four.

God

Part VI brings us to the heart of the *Meditations*: what Descartes wants to maintain above all is that we are created by a benign God and therefore cannot be deceived about what we find most evident. This is the complex thesis from which it follows that human beings can acquire *scientia*. Meditation Three also purports to establish that the will that creates us as we are also creates and keeps in existence things that *scientia* is applied to: not just material things and their motions, but also mathematical things, like the natures of geometrical figures touched on at the beginning of Meditation Five.

Stephen Menn opens Part VI with a careful discussion of the programme and Augustinian inspiration of Meditation Three. Like Augustine, Descartes seeks in the *Meditations* to produce knowledge of God, from which knowledge of everything else becomes possible. Knowledge of God leads to knowledge of everything else when God is known as the benign creator of our minds – the one who implants in them the ingredients of physics and the other sciences. Menn argues persuasively that by the time of the *Meditations* Descartes had abandoned one picture of how science might be shown to be possible – the picture outlined in the *Regulae* – and put in its place something suggested by Augustine's *Confessions* and *On Free Will*.

One of the most distinctive theses of Cartesianism is that the eternal truths are created. In some interpreters' hands, this thesis has been taken to mean that there are no necessary truths, that God, if he chose to, could make it false that 2+2=4. Curley thinks that Descartes did believe in necessary truths, but not in the necessity of their necessity. Once God decrees that 2+2=4, it is so for good, but he need not have decreed it. Curley motivates this doctrine very persuasively by reference to a dispute between the Thomists and Suarez, in which Suarez's side is rejected by Descartes as a misunderstanding of God's omnipotence. Curley admits that his interpretation does not save Descartes from all criticism, but it leaves him with a doctrine that is less bizarre than is usually credited to him.

In the final paper of Part VI, Daniel Garber considers the connection between God's role as sustainer of the material world and the causes of motion. The position Garber arrives at depends on the claim that Descartes does not quite dispense with forms, or even substantial forms. 'God enters Descartes's physics to do the business substantial forms did in the Aristotelian system, as he understood it, to cause bodies to behave in their characteristic ways. … [A]nd Descartes's God is understood to cause motion in just the way the forms were taken to do it, that is, on Descartes's account, in just the way we do it: by way of an impulse that moves matter in a way we can comprehend only through immediate experience'.

The experience of raising my arm is an experience of my making my arm go up, and that is as close as we get to a grasp of how, with respect to the characteristic motions of a type of matter, God makes matter move that way. God's imparting motions is not the same as God's sustaining the world, however, as Garber shows by distinguishing Descartes's position from that of one his followers, La Forge.

The Derivative Sciences: Cartesian Ethics

In the preface to the French edition of *The Principles of Philosophy* Descartes likened metaphysics and physics to the roots and the trunk of a tree. But his picture also makes room for three sciences that grow out of the trunk and from which the fruits of science come. These sciences are mechanics, medicine and morals, and it is these that are supposed to produce the most good and the most tangible good in human life. The final section (Part IX) of this anthology samples a still nascent literature in English on these derivative sciences, focusing on morals.

Descartes never succeeded in formulating a finished science of morals, though there are probably elements of it in the correspondence with Elizabeth and in *The Passions of the Soul*. He threw light on the finished science by contrasting it with provisional morals. This provisional morals was the first thing a methodical seeker after *scientia* was supposed to put in place and leave in place before calling the traditional theoretical sciences into question and rebuilding them on new foundations. Eventually the provisional morals would be superseded by a moral science informed by metaphysics and physics. The provisional morals is outlined in the *Discourse*. Coolidge carefully outlines the provisional morality and explains why it could at best be provisional. It could not regulate action beyond that leading to a narrow sort of Cartesian contentment, and in any case, it never demonstrates that this narrow contentment is true happiness. Worse, perhaps, the method does not help to decide when offending against some laws, for example, the decrees of one's church, by some public act, like printing a physics treatise, is justified.

John Cottingham's 'Cartesian Ethics' looks beyond the provisional morality of the *Discourse* to Descartes's scattered remarks about the dependence of a real moral science on physics. He finds in Descartes an anticipation of the discovery of conditioned response and also of the Freudian insight that some of what makes us act, especially act irrationally, is opaque to us. Descartes sees that conditioning can change a pattern of behaviour and his science of the brain provides an explanation of this. Descartes also sees that in ordinary practical life we are cut off by scientific ignorance as much as anything else from the causes of some of our irrational habits or attachments. The point is that underlying physiological factors can make the habits or passions in question inscrutable or opaque to reason. Finding out about these causes – as Descartes thinks he found out about the cause of his attraction to cross-eyed women – can deliver us from the habits. More generally, the metaphysical and physical knowledge involved in knowing ourselves as human beings enables us to see that the passionate and sensory parts of our lives, hindrances to us as pure enquirers and even as pursuers of the straight and narrow, are not to be despised. They have their place and do us good so long as we know the limits of the senses and are able to control (not rise above or excise) the passions.

Adriaan Peperzak's closing essay dwells on the deep divide in many of Descartes's methodological remarks between theoretical and practical life, and considers how far Descartes's idea that God is the key to the construction of the sciences, and therefore the requirements of wisdom, recapitulates old ideas in Graeco-Christian thought. Like Cottingham, who denies that Descartes's stoic-looking moral precepts really are orthodox stoicism, Peperzak denies that Descartes reuses the idea of a special sort of conversion as a key to wisdom. He thinks Descartes typically tries to convert people to pure theory, not spiritual truth, and this opens him to a reading about the divorce of the scientific from the ethical in the history of modern philosophy that is due to Levinas. In a certain sense Descartes's God is too *much* the God of philosophy.

Not all of Descartes's philosophy is covered by this collection. For example, I have left out work on Descartes's positive psychology, his theory of medicine, his philosophy of logic and mathematics.[6] But the central topics are well represented here, and the reader ought to get a sense from the essays included of where some of the live controversies in the current literature lie. Descartes has certainly not subsided into the background of philosophical thought in the late 20th century, and it is certain that his work will continue to be studied and debated in the new milennium.

Notes

1 See S. Gaukroger (1995), *Descartes: An Intellectual Biography*, Oxford: Clarendon Press; D.M. Clarke (1982), *Descartes's Philosophy of Science*, Manchester: Manchester University Press; W. Shea (1991), *The Magic of Numbers and Motion*, Canton, MA: Canton Publishing; D. Garber (1992), *Descartes's Metaphysical Physics*, Chicago: University of Chicago Press.

2 See Sorell (1994), 'Descartes's Modernity' in J. Cottingham (ed.), *Reason, Will and Sensation: Studies in Descartes's Metaphysics*, Oxford: Clarendon Press, pp. 29–46.

3 See, for example, the articles by Garber and Curley in Part VI of this collection. There are further signs of the growing convergence of French and English commentary in recent anthologies that draw on both traditions. See R. Ariew and M. Grene (eds) (1995), *Descartes and his Contemporaries*, Chicago: University of Chicago Press; S. Voss (1993), *Essays on the Philosophy and Science of Rene Descartes*, Oxford: Clarendon Press; Cottingham op. cit. and J-L. Marion and J-M. Beyssade (1994), *Mediter et Repondre*, Paris: Presses Universitaires de France. See also Cottingham (1988), *The Cambridge Companion to Descartes*, Cambridge: Cambridge University Press and M. Grene (1985), *Descartes*, Minneapolis: University of Minnesota Press.

4 His best known book on Descartes is (1981), *Sur la theologie blanche de Decartes*, Paris: Presses Universitaires de France.

5 '*Cogito ergo sum*; Inference or Performance', *Philosophical Review*, **71**, pp. 3–32.

6 On his psychology, see Susan James (1997), *Passion and Action: the Emotions in 17th century Philosophy*, Oxford: Clarendon Press, chs. 5, 8 and 11. On his logic, see Emily Grozholz (1989), *Cartesian Method and the Problem of Reduction*, Oxford: Clarendon Press and S. Gaukroger (1989), *Cartesian Logic*, Oxford: Clarendon Press. On Descartes's medicine, see G.A. Lindeboom (1978), *Descartes and Medicine*, Amsterdam: Rodopi.

Selected Further Reading

In addition to items mentioned in the footnotes to the introduction, the following are notable contributions to the recent literature:

Clarke, D.M. (1989), *Occult Powers and Hypotheses*, Oxford: Clarendon Press.

Cottingham, J. (ed.) (1992), *The Cambridge Companion to Descartes*, Cambridge: Cambridge University Press.

Des Chene, D. (1996), *Physiologia: Natural Philosophy in Late Aristotelian and Cartesian Thought*, Ithaca: Cornell University Press.

Gaukroger, S. (ed.) (1980), *Descartes: Philosophy, Mathematics and Physics*, Sussex: Harvester.

Grene, M. (1985), *Descartes*, Minneapolis: University of Minnesota Press.

Jolley, N. (1990), *The Light of the Soul: Theories of Ideas in Leibniz, Malebranche, and Descartes*, Oxford: Oxford University Press.

Lennon, T. (1993), *The Battle of the Gods and Giants: the Legacies of Descartes and Gassendi 1655–1715*, Princeton: Princeton University Press.

Marion, J-L. (1991a), *Questions cartesiennes*, Paris: Presses Universitaires de France.

Marion, J-L. (1991b), *Sur le prisme metaphysique de Descartes*, (2nd edn), Paris: Presses Universitaires de France.

Markie, P. (1986), *Descartes's Gambit*, Ithaca: Cornell University Press.

Rodis-Lewis, G. (1984), *Descartes*, Paris: Libraire Generale Francaise.

Rodis-Lewis, G. (1991), *L'anthropologie cartesienne*, Paris: Presses Universitaires de France.

Sepper, D. (1996), *Descartes's Imagination: Perception, Images and the Activity of Thinking*, Los Angeles: University of California Press.

Part I
Method

[1]

Mathematical Demonstration and Deduction in Descartes's Early Methodological and Scientific Writings

DOREN A. RECKER

THERE ARE NUMEROUS PASSAGES in Descartes's writings in which he seems to advocate a strong mathematico-deductive approach to physical science (e.g., AT, 1: 144; 2: 268; 3: 39, 297–98; 6: 19 [CSM, 1: 120–21]; 8–a: 78–79 [CSM, 1: 247]; 9–b: 10–11 [CSM, 1: 184–85]; 10: 364–66 [CSM, 1: 11–13]; 11: 47 [CSM, 1: 97]).[1] These and similar passages have fueled many attempts to fit Descartes's scientific program onto one or another logico-deductive or mathematical model. On the other hand, it has long been realized that Descartes *also* appealed frequently to experiential verification within his scientific works.[2] Further, the context in which Descartes attempted to respond to a number of competing models of the proper foundation for science was complex. Even his more familiar metaphysical and epistemological writings (which have been traditionally taken as buttressing a strict deductivist model of his science) need

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I would like to thank Ernan McMullin, Janet Broughton, and two referees for the *Journal* for comments and criticisms on earlier drafts of this paper which helped me to improve the present version considerably.

[1] References to Descartes's works are to the Adam & Tannery edition (AT), *Oeuvres de Descartes*, ed. C. Adam and Paul Tannery, new ed., 11 vols. (Paris: Vrin, 1964–1974). Whenever translations of cited passages are provided in John Cottingham, Robert Stoothoff, and Dugald Murdoch, eds. and trans., *The Philosophical Writings of Descartes*, 3 vols. (New York: Cambridge University Press, 1984), I have also provided references to this translation (CSM).

[2] See, for example, Ralph M. Blake, "The Role of Experience in Descartes' Theory of Method," in Edward H. Madden, ed., *Theories of Scientific Method* (Seattle: University of Washington Press, 1960), 74–103; Desmond M. Clarke, "The Ambiguous Role of Experience in Cartesian Science," *PSA* (1976): 1: 151–64; and *Descartes' Philosophy of Science* (University Park: Pennsylvania State University Press, 1982), Chap. 2.

to be recast in light of increased attention being paid to Descartes's Aristotelian and Neoplatonist-panpsychist rivals. Both his apparent attacks on sense experience and his famous metaphysical dualism, for example, take on new connotations when viewed as responses and challenges to contemporary *alternative* foundations for science.[3]

The biggest problem confronting the traditional mathematico-deductivist interpretation, however, is that there are precious few "deductions" or "mathematical demonstrations" (in the usual sense) to be found in Descartes's scientific writings. While Descartes frequently seems to have endorsed the traditional interpretation when talking *about* his science, he does not seem to have practiced what he preached *within* his scientific works. Either, then, we must view his methodological pronouncements as inconsistent with what he was in fact able to achieve (indeed as *wildly* optimistic given his actual scientific results), or we must reconsider the possible meanings of his deductivist-mathematical terminology. I opt here for the second alternative, and argue that a much broader interpretation of 'deduction', 'demonstration', and 'mathematics' is more consistent both with what is found in Descartes's scientific works and with a plausible interpretation of Descartes's use of such terms within his early methodological texts. Further, unlike other attempts to broaden the interpretation of 'deduction', etc., I also argue that Descartes does not even restrict its application to arguments or equations (nor does he restrict 'mathematics' to equations or figures). To prepare the groundwork for this interpretation, and further support the need for such a view, we need first review a variety of earlier readings and compare then with actual examples taken from Descartes's scientific writings.

1. TEXTUAL AND CONTEXTUAL DIFFICULTIES IN DESCARTES'S METHODOLOGICAL WRITINGS

The two works most often taken as presenting Descartes's method are, of course, the *Discourse on Method* (AT, 6: 1–78; CSM, 1: 109–51), and the *Rules*

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[3] See, for example, Daniel Garber, "*Semel in Vita:* The Scientific Background to Descartes' *Meditations,*" in Amelie O. Rorty, ed., *Essays on Descartes' Meditations* (Berkeley: University of California Press, 1986), 81–116; Gary Hatfield, "The Senses and the Fleshless Eye: The *Meditations* as Cognitive Exercises," in ibid., 45–79; Richard S. Westfall, *The Construction of Modern Science* (New York: Cambridge University Press, 1977), 25–33; Marjorie Grene, *Descartes* (Minneapolis: University of Minnesota Press, 1985), 32, 40, 62; Etienne Gilson, *Études sur le Rôle de la Pensée Médiévale dans la Formation du Système Cartesien* (Paris: Vrin, 1975 [4th ed.]), 17–30, 141–90; John Schuster, *Descartes and the Scientific Revolution*, 2 vols. (Ph.D. Dissertation: Princeton University, 1977), Vol. 1: 24–30, and *passim;* Carolyn Merchant, *The Death of Nature* (San Francisco: Harper & Row, 1983), 192–205; Robert Lenoble, *Mersenne ou la Naissance du Mécanisme* (Paris: Vrin, 1943), 82–167; Edward John Kearnes, *Ideas in Seventeenth-Century France* (New York: Saint Martin's, 1979), 14–15, 23–24, 29, 33; Allen G. Debus, *The Chemical Philosophy: Paracelsian Science and Medicine in the Sixteenth and Seventeenth Centuries*, 2 vols. (New York: Science History Publications, 1977), Vol. 1: 145–73, 260–79.

for the Direction of the Mind (AT, 10: 359–469; CSM, 1: 7–78). The structure and composition of both works are highly problematic and controversial. The *Discourse* was originally conceived as a brief preface to two scientific works, the *Dioptrics* and the *Meteorology* (AT, 1: 329–30), but was then expanded in scope over a two-year period and published with the *Geometry* added. Though estimates of the precise stages of its composition vary and remain somewhat speculative, it seems that it was pieced together in patchwork fashion, with bits and pieces brought together from a variety of earlier writings covering a period of almost twenty years.[4] This patchwork quality should alert the reader that interpretive difficulties might be expected.

The stages of composition for the *Rules* are at least as problematic and controversial as those for the *Discourse*. As with the latter, the *Rules* were apparently jury-rigged together, with different sections (and sometimes different passages within the same Rule) being formulated at different times between 1619 and the 1640s.[5] Since both of these works are frequently cited in discussions of Descartes's "method," one must be very careful in determining how he actually used concepts such as 'deduction' and 'mathematical demonstration', as well as how he attempted to instantiate them with examples. If Descartes's major methodological works are patchworks, it is especially important to guard against reading current meanings into these contextually troubled texts, as well as against looking for more consistency and rigor than the genealogy of their composition seems to warrant.

The temptation to equate Descartes's uses of 'demonstration', 'deduction', 'proof', etc., with strict logical deduction should be tempered with appropriate historical caution. As Desmond Clarke and others have shown, these methodological concepts did not always correspond to more recent usage.[6] For example, the French verb *déduire* in the seventeenth century was used to connote

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[4] See E. Denissoff, *Descartes: Premier Théoricien de la Physique-Mathématique* (Louvain: Universitaires de Louvain, 1970), 11–37; Clarke, *Descartes' Philosophy of Science*, 65–66, 180–95; L. J. Beck, *The Method of Descartes* (Oxford: Clarendon Press, 1964), 3–4.

[5] John A. Schuster, "Descartes' *Mathesis Universalis*, 1619–1628," in Stephen Gaukroger, ed., *Descartes: Philosophy, Mathematics, and Physics* (Totowa: Barnes & Noble, 1980), 41–96; Pamela A. Kraus, "From Universal Mathematics to Universal Method: Descartes' 'Turn' in Rule IV of the *Regulae*," *Journal of the History of Philosophy* 21 (April 1983): 159–74; Frederick P. Van De Pitte, "The Dating of Rule IV–B In Descartes's *Regulae ad directionem ingenii*," *Journal of the History of Philosophy* 29 (July 1991): 375–95; J. Sirven, *Les Années d'Apprentissage de Descartes, 1596–1628* (Paris: Albin, 1928), 342–58; Beck, *Method*, 8–11.

[6] Desmond Clarke, "Descartes' Use of 'Demonstration' and 'Deduction'," *Modern Schoolman* 54 (1977): 333–44; and *Descartes' Philosophy of Science*, 207–10; Steven M. Nadler, "Deduction, Confirmation, and the Laws of Nature in Descartes' *Principia philosophiae*," *Journal of the History of Philosophy* (July 1990): 359–83, esp. 375; Daniel Garber, "Science and Certainty in Descartes," in Michael Hooker, ed., *Descartes: Critical and Interpretive Essays* (Baltimore: Johns Hopkins, 1978), 114–151, esp. 117–20; Grene, *Descartes*, 58–59.

"drawing-out a discussion," or "providing a detailed explanatory narration." Clarke cites French-English dictionaries from 1605, 1632, and 1694, all presenting modifications of these particular connotations.[7] Similarly, Nadler reminds us that 'deduction' and 'demonstration' were *generally* used in a much broader way in the seventeenth century (for example, see Locke's *Essay*, Bk. 4, Ch. 2, Sections 3–9).[8]

Descartes also states that he uses the verb *démonstrer* in the "ordinary way" to mean either "to prove" or "to explain" (AT, 2: 198). But he also sometimes uses *démonstrer* and *déduire* interchangeably, indicating that "to deduce" can similarly connote either "to prove" or "to explain."[9] There are also many cases in which Descartes claims that he "proves" a proposition via experiential verification rather than through logical deduction.[10] That is, Cartesian "demonstrations" and "deductions" need not involve "proofs," which in turn need not involve logical deductions as currently understood. Given such nonstandard uses of his key methodological terms, the *only* way to determine Descartes's meanings is to look carefully at the examples he provides. Similarly, "flexible" usage is to be expected from the patchwork nature of his methodological writings.

Both of the methodological texts contain numerous examples of nonstandard usage. In Rule 10, for example, Descartes discusses the acquisition of sagacity (or 'acuity'—*sagacitas*), a mental quality which he earlier claimed should be cultivated to enhance one's capacity for *déduction* (AT, 10: 400; CSM, 1: 33). He proposes in this Rule that training for acquiring sagacity should include tackling the simplest arts in which "order reigns," viz., weaving, tapestry-making, or embroidery (AT, 10: 404; CSM, 1: 35). Weaving is not ordinarily suggested as preparatory for excelling in mathematical deduction (!), but, as we shall see, very general skills associated with such arts (such as recognizing how simple parts combine together to form complex wholes) *do* play central roles in Descartes's broad concepts of 'deduction', etc.

The *Rules* provide additional difficulties for interpreting Descartes's method since they were never finished (only half of the projected thirty-six Rules are found in the existing text—AT, 10: 399, 429; CSM, 1: 32, 50–51). Why this work was never completed remains problematic (AT, 1: 137–38), but a number of excellent hypotheses have been advanced.[11] Until recently I favored the hypothesis that the *Rules* were abandoned in favor of detailed and varied scientific investigations culminating in *Le Monde,* together with a corresponding epistemological-metaphysical foundation for Descartes's "new science."[12] Since reading a new interpretation of the composition of Rule 4, however,[13] I am less confident that the extant work was ever really abandoned by Descartes, since he appears to have returned to it in the early 1640s.

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[7] Clarke, *Descartes' Philosophy of Science*, 208; and "Physics and Metaphysics in Descartes' *Principles*," *Studies in the History and Philosophy of Science* 10 (1979): 89–112, esp. 97.

[8] Nadler, "Deduction, Confirmation and the Laws of Nature," 375.

[9] Clarke, *Descartes' Philosophy of Science*, 209–210; Nadler, "Deduction, Confirmation, and the Laws of Nature," 376–77.

[10] Clarke, "Descartes' Use of 'Demonstration' and 'Deduction'," 334–37.

In any event, and despite the fact that the context of composition for this work is very problematic, it has never been seriously maintained that the *total* project of the *Rules* was abandoned by Descartes. In fact, one of the most contentious issues in Cartesian scholarship involves precisely which aspects of this early methodological program were carried over into his "mature" writings. For this reason, as well as because the apparent stress on "mathematical demonstration" in the *Rules* is often used to buttress deductivist readings on Descartes's science, I will need to address briefly some of the relevant passages to show why they do not support the mathematico-deductivist structure which has been erected around them.

For some interpreters Descartes's "method" has been closely linked (if not *identified*) with his notion of *mathesis universalis,* discussed in the latter half of Rule 4 (AT, 10: 374–79; CSM, 1: 17–20). These interpretations are based on translating *mathesis universalis* as "universal mathematics," and thus connecting Descartes's "method" with some sort of generalized "mathematical" approach to science.[14] Others have argued that this section of Rule 4 is aberrant, representing much earlier concerns than those found in surrounding Rules. This reading, then, agrees with the above interpretation in translating *mathesis* as "mathematics," but places the composition of the second half of Rule 4 in the vicinity of 1619 when Descartes *was* occupied with more narrowly "mathematical" issues. Therefore the universal "method," applicable to all investigations into truth, that Descartes is postulating in the *Rules* (the title of Rule 4, for example, is "Necessaria est Methodus ad rerum veritatem investiquandum") should *not* be associated with the more narrowly conceived "Universal Mathematics" represented only in the aberrant section of Rule 4.[15]

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[11] See, for example, Schuster, "Descartes' *Mathesis Universalis,*" 73–79; and *Descartes and the Scientific Revolution,* 2: 510–18; Clarke, *Descartes' Philosophy of Science,* 179–80.

[12] Schuster, *Descartes and the Scientific Revolution,* 2: 519–30, 580–605; Henri Gouhier, *La Pensée Religieuse de Descartes* (Paris: Vrin, 1924), 66–80. But see also Kraus, "From Universal Mathematics to Universal Method."

[13] Van de Pitte, "The Dating of Rule IV–B."

[14] See, for example, Jacob Klein, *Greek Mathematical Thought and the Origin of Algebra,* trans. Eva Brann (Cambridge: MIT, 1968), 197 ff., 294 note 310; Beck, *Method,* 36–46, 194–202, 307; E. J. Dijksterhuis, *The Mechanization of the World Picture, Pythagoras to Newton,* trans. C. Dikshoorn (Princeton: Princeton University Press, 1986), 403–406; Gaston Milhaud, *Descartes Savant* (Paris: Felix Alcan, 1921), 68–69; Edwin A. Burtt, *The Metaphysical Foundation of Modern Physical Science* (New York: Harcourt, Brace, & Co., 1927), 97–99. Even Clarke identifies "Method" with "Universal Mathematics," though he certainly has a nonstandard interpretation of the latter. See Clarke, *Descartes' Philosophy of Science,* 167–68.

This interpretation is, of course, problematic for those advocating "Universal Mathematics" as representing Descartes's method.[16] It also has much to recommend it. The main support for this reading is threefold: i) the term *mathesis universalis* does not occur elsewhere in Rule 4 or in the rest of the *Rules;* ii) the last half of Rule 4 appears to be much narrower in scope than the rest of the *Rules;* and iii) this section of Rule 4 does not flow continuously from the first half, but appears to cover much of the same ground, apparently redundantly.[17] This aberrant section also appears to be restricted to traditional and narrowly construed "mathematical" sciences—viz., arithmetic, geometry, astronomy, music, optics, mechanics, etc. Descartes claims here that even those with merely a trace of learning "can without difficulty distinguish what belongs to *mathesis* and what belongs to other disciplines" (AT, 10: 377; CSM, 1: 19). That is, on the usual translation of *mathesis* as "mathematics," Descartes is here advocating a distinction between mathematical and non-mathematical disciplines, with *mathesis universalis* providing a methodological framework only for the former. Again, however, the remaining Rules espouse a "method" applicable to *all* investigations into truth.

Different textual evidence against identifying Descartes's method with "Universal Mathematics" has recently been provided by Frederick P. Van de Pitte.[18] Although the major thrust of his article is directed against those who advocate dating the second half of Rule 4 within Descartes's early "mathematical period," his main evidence for this requires questioning whether *mathesis should* be translated as "mathematics." Basically, careful textual analysis reveals that the only other clear references to *mathesis* in Descartes's writings occur in the 1640s, twenty years after his early concern with narrowly mathematical problems.[19] Also, the apparent context for Descartes's interest in *mathesis* in the 1640s involves references to the *Greek* rather than to the contemporary Latin usage—viz., as a general "process of learning" or "universal method," rather than as "mathematics." Interpreted in this manner, *mathesis universalis* does fit in with the emphasis on "universal method" found in the *Rules*, and its occurrence in the second half of Rule 4 indicates that Descartes returned to this text more than a decade after its original composition. Following the rich details of Van de Pitte's argument would lead us too far astray from present concerns, but enough has been said to indicate that his reformulation of the dating of the latter half of Rule 4 would strengthen rather than weaken the problems confronting attempts to identify Cartesian method with "Universal Mathematics."

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[15] Schuster, "Descartes' *Mathesis Universalis,*" 42–47; Kraus, "From Universal Mathematics to Universal Method," 164–72.

[16] This is one reason I once favored it, though my *main* reason for rejecting traditional "mathematical" interpretations has always been that there is so little corresponding to such readings to be found in Descartes's scientific writings.

[17] Pamela Kraus presents a very good discussion of this point in "From Universal Mathematics to Universal Method," 164–69.

[18] Van de Pitte, "The Dating of Rule IV–B."

[19] Ibid.

It would also be problematic to simply identify Descartes's method with physico-mathematics, or the attempt to express physical problems in mathematical form (*à la* Galileo) so they can be subjected to mathematical demonstration. Descartes does provide apparent examples of such procedures here and there throughout the extant *Rules*, particularly in Rule 13 and the following rules (AT, 10: 431, 440–43, 450–51; CSM, 1: 52, 57–59, 63–65). Rules 13–24 as projected in Rule 12, however, were supposed to represent only the "method" as applied to "perfectly understood problems" (which come up almost exclusively in arithmetic and geometry), while problems which "are not perfectly understood" were to be handled in the never-completed Rules 25–36 (AT, 10: 429–30; CSM, 1: 50–51). Hence, we must be extremely cautious in extrapolating from the geometrical examples considered in Rule 13 and the following rules to any general conclusions concerning Descartes's science. This need for caution is further underscored by the fact that there is evidence that Descartes was moving away from his earlier enthusiasm for narrowly mathematical problems, at least by the 1630s (AT, 1: 139; 2: 361–62).

Further, Descartes expressed little sympathy for the sort of physico-mathematics found in Galileo's *Two New Sciences*. After reading this work in October, 1638, Descartes tells Mersenne that he has nothing to say about the geometrical demonstrations pervading it because he "doesn't have the patience to read them" (AT, 2: 388). His attitude towards Galileo's approach here is both interesting and puzzling. On the one hand he praises Galileo for "trying to examine physical questions by mathematical reasoning." On the other hand he criticizes him for failing to proceed in an "orderly manner," and for seeking causes (*raisons*) for isolated effects without first establishing their foundations (AT, 2: 380). That is, it is unscientific from Descartes's perspective to attempt to describe mathematically the motion of falling objects without first explaining the *cause* of their motion toward the earth (weight or gravity—AT, 2: 385; 1: 304–305).

An adequate (mechanical) explanation of gravity, however, would show that it is due to the pressure of subtle particles in motion within a *plenum*. So, Galileo's elegant physico-mathematical kinematics cannot represent *scientia*, since the simplifying assumption of motion through a void is physically untenable (AT, 1: 230–31). Descartes also seems to feel that the phenomena of free fall involve too many complexly interwoven variables to be adequately represented by simple mathematical diagrams (the *heart* of seventeenth-century physico-mathematics), so that Galileo's "laws" would only apply to some of the simpler cases of falling objects (AT, 2: 232, 433–34; 1: 230–31, 261).[20] This sort of objection is puzzling, since Descartes's own laws of impact seem to be at least as abstract and "unrealistic" as Galileo's law of free fall (AT, 8–a: 68–70).[21] I will return to this problem later. For now it is sufficient to point out that, however such difficulties are worked out, it does not suffice to point to the prevalence of physico-mathematical approaches in the Scientific Revolution and to a few examples of geometrical diagrams in Descartes writings in order to elucidate his "method" (i.e., Descartes's frequent appeals to "geometrical demonstrations" are not to be taken as advocating this particular tradition). And, again, there are *very* few examples in his scientific writings that can be forced onto such an interpretation.

Another (more common) set of interpretations of Descartes as a mathematico-deductivist theorist stresses the alleged *deductivist* aspects of his system, instead of identifying his "method" with "Universal Mathematics" or physico-mathematics. Here the "geometrical" aspect of Descartes's methodological claims is understood in terms of an axiomatic-deductive system patterned after Euclid's *Elements*. Such a reading may also seem to provide a way to reconcile Descartes's claims that his physics *is* geometry with the fact that his science is almost exclusively *qualitative*. That is, on this interpretation, Descartes was taken with the deductive (in our sense) nature of classical geometrical reasoning, rather than with (or at least in addition to) narrowly mathematical representations of physical situations.

The following oft-cited passage from *Discourse* 2 offers some of the strongest textual support for such deductivist interpretations.

> The long chains of reasonings, completely simple and easy, which geometers are accustomed to use to arrive at their most difficult demonstrations, had given me the occasion to suppose that all things which could fall under human understanding follow each other in the same fashion. And, provided only that one abstains from taking anything as true which is not, and always takes care to preserve the order necessary for deducing one thing from another, there could be nothing so distant that it could not finally be reached, nor anything so hidden that it could not be discovered. I had no great

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[20] See also, Grene, *Descartes*, 68–69; A. R. Hall, *The Scientific Revolution, 1500–1800*, 2nd ed. (Boston: Beacon, 1966), 94–97; Mary Boas, "The Establishment of the Mechanical Philosophy," *Osiris* 10 (1952): 412–541, esp. 449–51; Bernard Williams, *Descartes: The Project of Pure Inquiry* (Atlantic Heights: Humanities Press, 1978), 255.

[21] See, for example, Richard J. Blackwell, "Descartes' Laws of Motion," *Isis* 57 (1966): 220–34; Clarke, *Descartes' Philosophy of Science*, 211–33.

> trouble searching for the things with which I needed to begin, because I already knew that these would be the simplest and easiest to understand. (AT, 6: 19; CSM, 1: 120)

These "simplest and easiest" starting points are usually taken to be the metaphysical foundations laid down in *Discourse* 4 and the *Meditations* (e.g., God's guarantee of the veracity of clear and distinct ideas). One can also add passages where matter is identified with extension and where mathematical demonstrations are said to be clearly and distinctly perceived. Then it may seem plausible to identify Descartes's "method" with an attempted axiomatic-deductive system extending from God to the submicroscopic components of physical objects![22]

Or, the deductivist approach can be interpreted as the *goal* of Descartes's method, which, when joined with passages where Descartes seems to admit that there are limits to this method, can be thought to explain the widespread appeal to experience in Descartes's science (AT, 8–a: 81, 100–101, 327; 11: 241–44; CSM, 1: 249, 256, 289, 316–19). Versions of this reading now represent the "majority view," at least among those who take Descartes's science seriously.[23] The following passage from *Discourse* 6 has done much to fuel such interpretations.

> First I tried to derive [*trouver*] in general the principles or first causes of all that is or could be in the world; and for this I used only the notion of God who created it and certain seeds of truth which are naturally in our souls. After this I examined what would be the first and most ordinary effects that I could deduce [*déduire*] from these first causes. It seemed to me that in this way I derived [*trouver*] the heavens, the stars, the earth, and even, on the earth, water, air, fire, minerals and other such things which are the most common of all and the simplest, and hence the easiest to understand. Then, when I wanted to descend to those effects which were more particular, these appeared to be so diverse that I did not believe that it would be possible for the human mind to distinguish the Forms or Species of bodies which actually exist on earth from innumerable others which could exist if it had so been the will of God. Hence, I thought the only way to bring these things back for our use was to come to the causes by means of their effects, and to make many particular experiments. (AT, 6: 63–64; CSM, 1: 143–44)

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[22] See, for example, Peter Machamer, "Causality and Explanation in Descartes' Natural Philosophy," in P. Machamer and R. Turnbull, eds., *Motion, Time, Space, and Matter* (Pittsburgh: University of Pittsburgh Press, 1976), 168–99, esp. 170–77; Martial Gueroult, *Descartes' Philosophy Interpreted According to the Order of Reasons: Vol. I, The Soul and God*, trans. Roger Ariew (Minneapolis: University of Minnesota Press, 1984), 5–7.

[23] See, for example, Garber, "Science and Certainty in Descartes," 123 ff.; Ernan McMullin, "Philosophies of Nature," *New Scholasticism* 43 (1969): 29–74, esp. 37–39; Blake, "The Role of Experience," 86 ff.; Beck, *Method*, 251–53; Richard J. Blackwell, "Descartes' Concept of Matter," in Ernan McMullin, ed., *The Concept of Matter in Modern Philosophy* (Notre Dame: University of Notre Dame Press, 1978), 71; and many others.

Descartes here seems to be saying that he grounded his science with principles already present in his mind, and then deduced from these certain of the more general physical truths. Then, however, he ran into difficulties attempting to deduce more detailed physical phenomena, and here was forced to resort to a more empirical approach. So, the story goes, while there are many appeals to experience in Descartes's scientific works, these represent more of a breakdown within his deductive apparatus than they do his preferred (deductivist) "method."

We must remember, however, the ambiguities cited earlier in Descartes's use of methodological terms like 'deduce'. If we cannot confidently equate Descartes's usage with any particular one among many possible meanings, the only way to determine what he had in mind in the above passage is to look at the examples he provides. *Discourse* 5 and the early sections of *Discourse* 6 provide a condensed and edited summary of the work Descartes had decided not to publish a few years previously, *Le Monde*. So, it is to this work that we must turn for information concerning exactly how he thought "the heavens, the stars, the earth, water, air, fire, minerals and other such things" were *deducible* from first causes.

In the second chapter of the *Treatise on Light*, for example, the "consuming power" of fire is reduced to the violent and rapid motions of its minute parts, which break up the conglomeration of parts in the object (here wood) being burned. The evidence given for this explanation is first experiential (we can *see* the small parts of wood being put into motion as the log burns), and then methodological (Descartes says that "it doesn't seem possible" to him "to conceive of a body's being able to move another unless it too is in motion"—AT, 11: 7–8; CSM, 1: 83). This claim is methodological because it rests on a restriction of legitimate explanations of physical movement to cases of contact between two or more bodies (i.e., a restriction to "mechanical" explanations in science), and this approach is here explicitly contrasted to pseudo-explanations in terms of Aristotelian "forms" and "qualities." Much of the support for this methodological constraint is also experiential, since 'change' and 'motion' understood in this way are "perfectly familiar to everyone," and are "self-evident" in the sense that "even rustics could not be ignorant of them," as opposed to the nonexperiential meanings attributed to them in the schools (AT, 10: 426; 8–a: 323–24; CSM, 1: 48–49, 286).

Similarly, earth, fire, and air can be distinguished in terms of their differing degrees of hardness or liquidity, that is, in terms of how their constituent parts are moving or resting with respect to one another (AT, 11: 13). Hard bodies, for example, have all of their parts touching with "no spaces left between any two of them," and with none of them moving with respect to the others. Liquid bodies, on the other hand (the most liquid being fire), have their constituent parts moving away from one another as swiftly as possible in diverse directions (ibid.). Again the justification for this distinction is experiential ("toutes les expériences sur lesquelles je jette les yeux me confirment en cette opinion"—AT, 11: 14, 16), and methodological (AT, 11: 25–26; CSM, 1: 89). And, again, these virtues of Descartes's explanations are contrasted with the obscurantism of the Schools (ibid.). Later in the same chapter the nature of the planets, the heavens, and the sun are likewise constructed from the behavior of their component parts (AT, 11: 29–30).

In what way are these conclusions "deducible" from principles and/or first causes? Let us first suppose that Descartes *does* unproblematically deduce certain physical principles from metaphysical truths known by the "light of reason." These physical principles would presumably include extension as the essence of matter (and subsequently a material *plenum*), and the three laws of motion derived from God's immutability (AT, 11: 36–47; CSM, 1: 92–97). Descartes does seem to make a strong deductivist claim for these laws at the end of chapter 7: "Besides the three laws that I have explained, I do not want to suppose any others than those which follow infallibly from the eternal truths on which mathematicians have been accustomed to base their most certain and evident demonstrations. . . . Those who can sufficiently examine the consequences of these truths and of our rules can recognize effects by their causes. And, to explain myself in terms of the Schools, they will be able to have *a priori* demonstrations of all which can be produced in this new world" (AT, 11: 47; CSM, 1: 97). So, assuming that the laws of nature and other general physical principles *are* "deducible" (in the ordinary way) from eternal truths, did (or could) Descartes "deduce" (in the ordinary way) the nature of fire, earth, air, etc., from them?

I don't see how. The justifications for the explanations of these natures that Descartes provided were in terms of experience and methodological constraints, *not* as conclusions of deductively valid arguments with true premises. Further, even given Descartes's version of the conservation of motion in Law 1, the tendency of bodies to move rectilinearly in Law 3, the general equilibrium condition for collisions in Rule 2, and the identity of matter and space, how did he end up with the *three* constituent *elemens* corresponding to "earth, air, and fire" from which all of the other natures were constructed? Even granting that in a *plenum* everything is full of matter so that apparently empty spaces must contain some invisible matter more subtle than "earthy" substances, etc., we do *not* get exactly three elemental sorts of matter in motion moving in the manner attributed to them in order to explain the relevant phenomena (AT, 8–a: 100–101; CSM, 1:

256–57).[24] *These* are derived via experience of actual objects and an attempt to explain their behavior in terms of simple, easily understandable assumptions *compatible with* first principles. So, again, it does not appear that Descartes's use of *déduire* here can be understood according to the deductivist interpretation.

Nor, in spite of apparently strong textual evidence to the contrary, do I find even the "deduction" of the general physical principles and the laws of motion to be as unproblematic as is often assumed.[25] Granted, Descartes makes some of his strongest deductivist-like claims concerning these examples (for example, the last two quotes cited). He also says that his derivation of the first two laws of motion from God's immutability would provide a firm enough foundation for them, "even if all that we ever experienced in the real world seemed to be manifestly contrary to what is contained in them" (AT, 11: 43; CSM, 1: 95–96). And these laws are explicitly claimed to "follow manifestly *from this alone;* that God is immutable and that, acting always in the same manner, he always produces the same effect" (AT, 11: 43; CSM, 1: 96; emphasis added). Still, given Descartes's frequent nonstandard uses of "deduction" and similar terms, we must be careful in assuming that the strength of his language here involves what we would recognize as logical deduction.

It is obvious that Descartes makes especially strong claims for these laws and physical principles, and that language such as "deduce" and "follow manifestly," etc., are meant to convey this special status to the reader. And, as Clarke points out, the "coincidence between Descartes' overestimation of the worth of his arguments, his use of the term 'deduction' to refer to them, and our own understanding of the distinction between deductive and inductive arguments"[26] make it very tempting to slip into current usage. Further, I do not want to claim that Descartes *never* uses 'deduction' and so on to refer to something like strict logical inference, or that he never reasons "analytically" (in our sense).[27] I deny only that such terms always or even usually correspond to the deductivist interpretation of Descartes's method.[28] In this case such scepticism is borne out by a careful investigation of how the laws of motion *are* defended in *Le Monde*.

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[24] These passages from the *Principles* might be taken to apply to "more particular matters" than the "natures" being discussed here. Even in the *Principles*, however, the three "elements" are *not* claimed to have been "already established." Rather, only that there is one type of matter in the universe, that it is divided into parts which move in diverse ways in a sort of circular motion, and that the overall quantity of motion is conserved are claimed to have been established. The size, speed, and particular types of "circles" described "cannot be determined solely by reason." Descartes's discussions of the three elements (and hence of the "nature" of air, fire, the sun, etc.) here (AT, 8–a: 101–106), and in *Le Monde* (already discussed) seem to belong to the latter category.

[25] See, for example, Machamer, "Causality and Explanation in Descartes," 175–76; Garber, "Science and Certainty," 125–26; Gary Hatfield, "Force (God) in Descartes' Physics," *Studies in the History and Philosophy of Science* 10 (1979): 113–40, esp. 123–26.

[26] Clarke, "Physics and Metaphysics in Descartes' *Principles*," 100.

[27] See, for example, his "definitional" argument against a vacuum in *Principles*, II: 16 (AT, 8–a, 49; CSM, 1: 229–30), and his use of *more geometrico* as an example of "synthetic method" in the Second Set of Replies (AT, 7: 160–70; CSM, 2: 113–20).

The first justification provided for the first law is based on an appeal to commonly accepted notions, viz., even Schoolmen accept that matter does not change its state unless it is interfered with. But the Aristotelians restrict this conservation principle to size, shape, etc., rather than extending it to "motion," and instead obscure this concept with unintelligible formulations. Descartes's treatment, however, is "more simple and more intelligible" than even simple geometrical concepts (AT, 11: 39; CSM, 1: 94). Then, after the second law is introduced, it is claimed that both of these laws "agree very well with all the experiences we have of bodies moving or ceasing to move by being pushed or stopped by other bodies" (AT, 11: 41; CSM, 1: 95). Even when we don't *see* the intervention of other bodies, such interference and aid can also be bestowed by the invisible *elemens* of air and fire already discussed (AT, 11: 42; CSM, 1: 95). Only after this does Descartes appeal to the strong language considered above (AT, 11: 43; CSM, 1: 95–96). Similarly, the third law is first defended in terms of common experiences (turning a wheel, swinging a stone in a sling), and is only subsequently claimed to be founded on God's immutability (AT, 11: 44; CSM, 1: 96).

At most, then, the laws of motion in *Le Monde* are (somehow) grounded or based upon God's immutability and/or the eternal truths,[29] *as well as* upon experience (the same can be claimed for the treatment of these laws in *Principles* II).[30] Generally, Descartes seems to hold that *both* some sort of special relation to privileged ideas and experiential confirmation are necessary for finding the "true nature of the visible world" (AT, 8–a: 98–99, 326; CSM, 1: 255, 288). Even when this "special relation" approaches modern "deduction," it is not *simply* deductive confirmation (Descartes doesn't rely exclusively on this relation in defending scientific claims). And, more frequently, Descartes's uses of "deduction," etc., can be shown to *not* involve the modern notion of logical deduction.

Finally, there is also a striking passage in *Discourse* 5 which has not received the same amount of attention as those cited earlier from *Discourse* 2 and

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[28] See the references in note 6.

[29] Descartes doesn't use 'deduce' and its derivatives in this immediate context. "Suivent manifestement" (from God's immutability), and "suivent infailliblement" (from the eternal truths) are as close as he comes. Being "founded" or "built" upon (*appuyer*) God's immutability, etc., are equally prevalent here.

[30] See also, Nadler, "Deduction, Confirmation and the Laws of Nature," 373–74, 381; Clarke, "Physics and Metaphysics in Descartes' *Principles*," 101–12; *Descartes' Philosophy of Science*, 103–104.

Discourse 6. This passage immediately follows Descartes's summary of his interpretation of the mechanics of the heart.

> Those who are not acquainted with the force of mathematical demonstrations, and are not accustomed to distinguishing true from merely probable [*vraysemblables*] explanations [*raisons*], should not deny the explanation just provided without examining it. I want to caution them that this movement [of the heart] that I have just explained follows as necessarily from the simple arrangement of the organs of the heart that one can see with his eyes, and from the heat that one can feel with his fingers, and from the nature of the blood that can be discovered through experience, as the motions of a clock follow from the force, position, and shape of its counterweights and wheels. (AT, 6: 50; CSM, 1: 136)

Note that Descartes here appeals to "mathematical demonstrations," but his account is of the same sort as his explanations of the natures of "earth, the heavens, fire," etc., in *Le Monde*. That is, as claimed earlier, his notion of 'mathematical demonstration', like his notions of 'prove', 'deduce', 'demonstrate', etc., does not correspond to current usage. All of these methodological terms are instead often (not *always*) linked with qualitative explanations of physical objects in terms of the arrangements and motions of their constituent parts. This insight provides the necessary clues for an interpretation of such terminology that is more consistent with what one actually finds in Descartes's scientific writings.

2. MATHEMATICS AND DEDUCTION AS EXPLANATORY NARRATIONS

Once the temptation to read current meanings into Descartes's methodological pronouncements is overcome, the key to connecting his strong mathematico-deductivist claims with his surprisingly qualitative science can be found in the *Rules*. Descartes was here trying to abstract the *basis* for the certainty of the narrowly mathematical disciplines, and to develop *general* analogues for both the "objects" of these disciplines, and the structures of their "proofs" (AT, 10: 365; CSM, 1: 12). The former are presented as "simple natures" within his generalized method, while the latter are found in his constant insistence on the importance of "order."

Taking the latter first, consider the end of Rule 4 where Descartes summarizes *mathesis universalis*. He here claims that his method consists in "tenaciously complying with a definite order" [*ordo*], starting with the "simplest and easiest things" (AT, 10: 378–79; CSM, 1: 20). In the next Rule he makes the equally strong claim that his "entire method" consists of "ordering and arranging things" so that "complicated and obscure themes [*propositiones*]"[31] can be

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[31] I prefer this translation of *propositio* (rather than "proposition") so as to retain some of its original meaning as "the subject or theme of a discourse," for reasons that will soon be clear.

"gradually reduced to simpler ones," which are then taken as starting points for particular investigations (AT, 10: 379; CSM, 1: 20). It turns out that this "ordering" consists of dividing problems into "series," with the "simplest things" (within the series) handled first, and then covering the other members in a "continuous and uninterrupted movement of thought" (AT, 10: 387; CSM, 1: 25). So, the analogue for the *structure* of mathematical proofs is represented in Descartes's general method by careful attention to the *order* in which the component parts of a particular problem are addressed. This order can proceed in terms of what we in fact first come to know (*ordo cognoscendi*), and/or in terms of what in fact comes first (which, in a given series, is *causally* prior to the remaining members of the series—*ordo essendi*). Sometimes this corresponds with Descartes's later distinction between "analysis" and "synthesis," but, as usual, these methodological terms do not seem to be used univocally.[32]

The analogues for mathematical *objects* in Descartes's general method are the "simple natures" (or, the "starting points" within a given series), first discussed in Rule 6. There are only a few simple natures which can be intuited "immediately and as such [*primo & per se*]" *either* through a "light implanted [*insero*] within us," *or* via "sense experience," and it is these that are said to be "maximally simple within a series" (the *most certain* starting points—AT, 10: 383; CSM, 1: 22). Their certainty depends on their *immediacy* in that they are intuited *per se*, and not as conglomerates of parts, etc. And Descartes was sufficiently taken with their epistemic status to claim that their discovery constituted the "principle secret" of his method (AT, 10: 381; CSM, 1: 21).

I tend to agree with Schuster that Descartes's reliance here on immediate intuition was subsequently qualified in favor of (or at least complicated by the addition of) a metaphysical basis for his system. For one thing, immediacy by itself cannot distinguish "secondary" from "primary" qualities, and so cannot ground Descartes's preference for micromechanical explanations in science.[33] On the other hand, if Van de Pitte's analysis of Rule 4 is correct (as it certainly seems to be), Descartes continued to return to this early text even after the composition of his later "metaphysical works."[34] Further, I will argue that the basic project of the *Rules*, to *generalize* the certainty of narrow mathematical disciplines by abstracting from both their objects and their methods of proof, was *never* abandoned by Descartes (though it can be argued that he did explore somewhat different approaches to this project at different times).[35] And, I see this *broad* understanding of "mathematical method" as a way of reconciling Descartes's mathematico-deductive terminology with his qualitative micromechanical science.

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[32] For some examples (as well as radically different interpretations), see Jaakko Hintikka, "A Discourse on Descartes' Method," in Hooker, *Descartes*, 74–88; Gerd Buchdahl, *Metaphysics and the Philosophy of Science* (New York: University Press of America, 1988), 126–47; Grene, *Descartes*, 57–58; Peter A. Schouls, *The Imposition of Method* (Oxford: Clarendon, 1980), 19–21.

[33] Schuster, "Descartes' *Mathesis Universalis*," 73–79; *Descartes and the Scientific Revolution*, 2: 510–43.

[34] Cf. Van de Pitte, "The Dating of Rule IV–B."

Now I will provide some scientific examples. In Rule 8, Descartes provides an account of his discovery of the anaclastic (where parallel rays of light intersect at a single point after refraction). In this problem the "simple nature" in the series is the notion of "a natural power in general" (which is the last thing we come to know in the series, but the first thing on which the other members of the series depend—again, *ordo essendi/ordo cognoscendi*). "Natural powers," for Descartes, must be unpacked completely in terms of combinations of motions among particles of matter, rather than by appeal to any notion of 'powers' or activities within matter. After this is understood (that is, "natural powers" have been "de-animated") we can approach the particular motion of particles which constitutes our experience of light (the next step in the series). From here we can move to the problem of how changes in the angles of incidence and refraction depend on the way in which light passes through different transparent bodies. Finally we come to the only "narrowly" mathematical problem in the series, calculating how the ratios between the various angles of incidence and refraction determine the anaclastic (AT, 10: 394–95; CSM, 1: 28–29).

Note once again that there is little corresponding to ordinary "deduction" or "mathematical demonstration" in this example. Instead Descartes constructs a series in terms of what needs to be understood before subsequent steps can be followed, which *imitates* rather than reduces to the kind of "order" followed in well-constructed geometrical proofs. Also, the starting points ("simple natures") are meant to imitate the cognitive status of the simplest mathematical objects, so that to intuit them *is* to completely understand them. So, insofar as *any* set of problems can be constructed according to this general "order," I think that Descartes would be comfortable with labelling them 'mathematical'.

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[35] For example, perhaps Descartes also considered a more direct connection between geometrical shapes and the perception of physical objects, at least in the *Rules* (see for example, Rule 12). This would represent another (not, I think a competing) candidate for "mathematizing nature." For various versions of this sort of reading, see Schuster, "Descartes' *Mathesis Universalis*"; Nancy L. Maull, "Cartesian Optics and the Geometrization of Nature," in Gaukroger, *Descartes: Philosophy, Mathematics and Physics*, 23–40; Gaukroger, "Descartes' Project for a Mathematical Physics," in ibid., 97–140; Brian E. O'Neil, *Epistemological Direct Realism in Descartes' Philosophy* (Albuquerque: University of New Mexico Press, 1974).

Consider again the quote from *Discourse* 5 cited in the last section, where Descartes seems to link "mathematical demonstrations" with his qualitative and experiential explanation of the circulation of the blood. A crucial step in this claim involves a connection with the mechanical arrangement of a clock. That is, the complicated and problematic motions of this machine can be clearly understood by reducing the overall complexity to a series of interconnected motions caused by the *simple* mechanical interactions of easily understood parts. Similarly, complex biological phenomena can perhaps be reduced to order in such a way that they can be understood by a "continuous motion of thought" from perfectly understandable mechanical interactions taken as starting points.

A similar but more revealing example can be found in the *Treatise on Man* (the second part of the unpublished *Le Monde*—AT, 11: 119–202). Descartes (as one would expect) explains the movement of bodily organs "mechanically," without reference to any special "vital force" or mysterious principle of animation. To highlight this point, he uses the vitalist-sounding concept of "animal spirits" (*esprits animaux*) to refer only to the smallest particles of blood that are forced through the system by the action of the heart (thereby "de-animating" even living nature by reducing vital processes to the motions of parts of matter—AT, 11: 129; CSM, 1: 100). He then explains the behavior of various bodily organs in terms of the mechanical motions of these vital spirits through the veins, arteries and nerves of the body (AT, 11: 130–41; CSM, 1: 100–101). As he compared the heart to a clock in *Discourse* 5, he here explicitly compares the body to the mechanized fountain works then popular with the aristocracy (AT, 11: 120, 130–31, 202; CSM, 1: 99, 100–101, 108). Since the machine parallel is exact, and since the section of *Discourse* 5 cited is a summary of his work in the *Treatise on Man*, there is no reason to believe that Descartes would not also consider his treatment of neuromuscular action here to provide a "mathematical demonstration."

Careful analysis can again connect these mechanical, qualitative explanations with the method outlined in the *Rules*. Descartes again proceeds according to *order*, starting with the simplest diagrammatic account of the structure of nerves, and ending with the complicated motions necessary for actual neuromuscular activity (AT, 11: 132–38). Consider, for example, illustrations 4 and 5 referred to in this text (these can be found at the back of AT 11). The former is a schematic illustration of a device which moves to the left or right depending on the differential flow of liquid into inflatable sacs on either of these sides. The latter is a more or less accurate drawing of the muscles responsible for the actual motion of the eyelids. The former would enable one to understand relatively simple motions by a careful analysis of the motions of their component (simple) parts. This would then allow one to understand the incomparably more complex motions *of the same sort* that are carried out by the actual relevant organs in the body.

This sort of analysis is characteristic of Descartes's scientific writings and apparently counts as a "mathematical demonstration." This can be understood by remembering that "deduction" in the *Rules* means to clearly understand, or to "intuit" *each step* in a series once it is well-ordered (AT, 10: 387–88; CSM, 1: 25). Generally, when a series is qualitative and involves physical processes, the "simple natures" are immediately intuitable simple objects, and the "order" of the series consists in understanding how these and their simple motions can be combined into more complex conglomerations. We can attain this intuition of the connection of steps by illustrating them for our imagination[36] and/or providing detailed step-by-step descriptions (or "explanatory narrations," in keeping with contemporary uses of "deduction"[37]—AT, 10: 416–17; CSM, 1: 42–43). Again, I think that such a procedure corresponds to Descartes's general abstraction from narrow "mathematical demonstration" in the *Rules* (via "simple natures" and "order"), and may also help explain why he thought studying weaving, etc. (where complex patterns are similarly built up step-by-step from simple components) would constitute good preparatory training for deduction (AT, 10: 404; CSM, 1: 35). I am *not*, of course, claiming that these sorts of qualitative, mechanical explanations are *all* that Descartes counted as "mathematical demonstrations," but only that they would also count. This seems to fit better many of his actual examples than any of the usual mathematico-deductivist accounts.

Consider now the strong claims Descartes makes concerning discovering the nature of the magnet in Rule 12. He contrasts those who approach such a problem by looking for difficult and obscure solutions (Schoolmen and Neoplatonic magicians, for example) with someone who realizes that nothing *can* be known about the magnet that doesn't consist of "simple, self-evident natures." The latter will *deduce* [*deducere*] from the available experiences [*experimenta*] what sort of conglomeration of simple natures would be capable of "producing the relevant effects," and then would be able to make the "bold assertion" that he or she has "got hold of [*percipere*] the true nature of the magnet, insofar as this is possible" (AT, 10: 427; CSM, 1: 49–50). Descartes does not provide many details in the *Rules* concerning how this problem could be well-ordered, but he does provide an explanation of magnetic attraction in

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[36] I cannot develop the role of imagination within Descartes's science in this paper. My interpretation, however, owes much to the very suggestive study by Peter Gallison, "Descartes' Comparisons: From the Invisible to the Visible," *Isis* 75 (1984): 311–26, esp. 319–26.

[37] Cf. Notes 7 and 8 above.

Part IV of the *Principles*. Again the procedure is neither narrowly "mathematical" nor "deductive," but instead follows the general notion of *order* I have been discussing. We start, again, with simple parts of a complicated mechanism (here grooved particles), and then proceed to an account of how combinations of such easily understood shapes and their motions can produce the complicated phenomena (AT, 8–a, 275–80, 284–311). *This* represents typical Cartesian science!

Descartes was aware that we cannot always expect to find "absolutely simple natures" in our investigations, and must often rely on starting points that are only relatively simple (only a few simple natures can be intuited "immediately and as such"—AT, 10: 382–83; CSM, 1: 22). This means that our relative level of confidence in different series should reflect these differing starting points. When they display order *and* begin with absolutely simple natures, they have the cognitive status of narrow mathematical demonstrations. When they do not, they merely confer as much certainty as it is possible for us to achieve in such matters ("moral certainty"). This, I maintain, is the key to understanding many of the passages where Descartes seems to "waffle" concerning the status of his scientific explanations.

Many of these passages occur in letters responding to questions raised concerning the 1637 essays (accompanying the *Discourse*). In one such letter Descartes claims that he was only providing hypotheses sufficient to elucidate those properties of light that were necessary for grounding the practical purposes of the *Dioptrics*. A more adequate treatment, he claimed, was contained in the work which "contains the entire body of my physics" (the unpublished *Le Monde*—AT, 1: 562–63). In another letter of the same period he claimed that he was "awaiting the opportunity" to "demonstrate" the causes of phenomena he had treated as mere "suppositions" in the 1637 essays (AT, 2: 200). This seems to refer to his hope that the official position of the Church would eventually allow him to bring to light the full treatment he had written in *Le Monde*. There is no indication here that he does not think that he *has* demonstrated the causes of some of the relevant phenomena in *Le Monde* (already discussed), but only implies that such demonstrations do not occur in the 1637 essays.

In any event, the models for light he provided in the *Dioptrics* (tennis balls penetrating various substances and acquiring various "spins," etc.) are positively misleading with respect to his preferred physical explanation of vibrations within the *plenum*. Still, these models are not *useless* for his purposes since they do provide relatively ordered series (lacking "absolutely simple natures" as starting points). And the "relative simple natures" they employ (easily understood analogies if not *completely* simple components) allow for the production of a series adequate for practical purposes ("moral certainty"), and are certainly more adequate than the obfuscations of the Schools, etc.

Consider as well his response to Mersenne's query concerning whether or not his treatment of refraction in the *Dioptrics* constituted a "demonstration." Descartes responds that he thought it *did* insofar as it was possible to provide demonstrations in such matters, but it was also inappropriate to expect "geometrical demonstrations" in physics (AT, 2: 141–42). This is puzzling given the numerous passages where Descartes claims that his physics *is* geometry, and so on. Similarly, in a series of articles at the end of *Principles* IV, he first seems to admit that his scientific explanations are only "morally certain," but then immediately goes on to claim that some of them, at least, are "more than morally certain" (AT, 8–a: 327–28; CSM, 1: 289–90).

Such apparent inconsistencies are best understood as reflecting different degrees of confidence appropriate for the "series" underlying different explanations. In article 206 of *Principles* IV, for example, Descartes explains that "even concerning natural things" there are *some* that possess "absolute certainty" (AT, 8–a: 328; CSM, 1: 290). His first examples include the metaphysical guarantees for the proper use of our mental faculties, *narrow* mathematical demonstrations, and the fact that material things exist. So far, mathematico-deductivist interpretations can take solace. Then, however, he goes on to include the types of qualitative examples I have been emphasizing. Their certainty, he maintains, is based on the fact that "it is not possible to experience any external objects" unless they, in turn, "excite some local motion in our nerves." And *this* can only be produced by (for example) the sun or the fixed stars, if there is also a motion in them and in "all the intervening heavens" (AT, 8–a: 328–29; CSM, 1: 290–91). That is, the *plenum* (*and*, presumably, all the qualitative results "deducible" from it and the laws of motion discussed above) is *certain* for Descartes. If so, then at least the mechanical explanations he provided that are based upon "absolutely simple natures" (several of which have been sketched above) remain "more than morally certain." I would not want to claim that *all* of the apparent inconsistencies between Descartes's methodological pronouncements and his actual science can be resolved in this way (the patchwork nature of his major methodological texts, among other things, would count against this aspiration). But I do think that the above account offers a more promising beginning than do the alternatives discussed earlier.

Finally, there remains the puzzle concerning Descartes's "Rules of Impact" in *Principles* II (AT, 8–a: 67–70). The major difficulty for the position advanced here is not, as is sometimes claimed, that these rules contradict experience. For one thing, I have not maintained that the entire support for Cartesian science is experiential (cf. the discussion of the Laws of Motion, etc., in the last section). Descartes clearly thought that some of his principles had special epistemic status, and that *even if* experience did not bear them out (*not* that it did not, in fact, bear them out), he would feel compelled to postulate them anyway (AT, 11: 43; 9–b: 93; CSM, 1: 95–96, 245). Still, experience *does* bear out Descartes's physical principles (to his satisfaction), so the special status of some of his claims does not count against the claim that more experiential series could *also* be "certain." Also, as Clarke has pointed out, even the seven Rules of Impact do not, in fact, contradict experience, because they are explicitly claimed by Descartes to be counterfactual (AT, 8–a: 67, 70; 9–b: 93–94; CSM, 1: 244, 245).[38]

The problem for my interpretation is rather that their very abstract, counterfactual nature might be seen as undermining my earlier arguments against interpreting Descartes's method *à la* "physico-mathematics." I then stressed Descartes's apparent negative attitude toward this tradition as illustrated by the Galilean treatment of free fall. The puzzle is, if Descartes was in fact opposed to oversimplifying physical phenomena in order to present them "mathematically,"[39] why does he present his own Rules of Impact in a similar manner? I think that the answer lies in the ambiguity of 'mathematical' that I have been defending. Descartes did *not* oppose simplifying physical phenomena in order to present them "mathematically," if this is understood as following appropriate *order*, etc. In fact, my entire account is based on the view that this is precisely what Descartes attempted to accomplish in his physical science.

What he does object to is trying to "mathematize" physical phenomena without providing *causal* explanations for the phenomena (in this I think that he retained part of his Aristotelian training). His Rules of Impact may be counterfactual, but they are nonetheless based on the prior "deduction" of the *plenum* and the *real* principles of motion. So, unlike Galileo's kinematics, they would not, for Descartes, be grounded on physically *untenable* assumptions.

Descartes's move away from *narrow* geometrical demonstrations corresponded, I believe, with his insight that the *basis* of mathematical certainty lay in its particularly clear objects of investigation and in its particularly tightly connected proofs. He thought he had succeeded in abstracting analogues for both of these in his discovery of "simple natures" and "order" in the *Rules*. From then on he envisioned a physical science based on "mathematical demonstrations" construed in this way. This would allow for emphasizing qualitative, mechanical explanations, as long as they constituted "series" with completely transparent (simply shaped) objects added together step-by-step into the complicated behavior of natural objects actually observed. That is, Descartes viewed physical explanations much as a mechanical engineer understands simplified diagrams of complicated machinery. This is also why, I think, he consistently maintained that physical science needs to be justified "from both ends," in terms of its starting points, *and* in terms of its ability to "cover" the actual phenomena. In any event, such a reading is closer to what one actually finds in his scientific works than any of the other interpretations discussed.

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[38] Clarke, *Descartes' Philosophy of Science*, 228–40.

[39] That is, he appears to raise such objections during *this* period (1630s), when he was engaged in the scientific activities I have been analyzing. He was, of course, himself engaged in physico-mathematics at an earlier period, especially during his collaboration with Beeckman.

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Descartes: Methodological Ideal and Actual Procedure*

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"Je cite Descartes, je fais plus, je lui dédie mon livre. J'ecris contre une mauvaise philosophie, et je rappelle la bonne".

Declarations such as these are not uncommon – especially in France – not only in the seventeenth and eighteenth centuries, but also in the nineteenth and twentieth. The one just quoted appeared in 1863 in Philippe Flourens "De la phrénologie". Flourens claimed to understand the significance and meaning of Descartes' method: indeed he argued that he was merely applying it to the bumps on our head! We may have our misgivings about the depth of Flourens' probing of the Cartesian mind, but we can hardly fault him when he adds: "J'ai voulu être court. Il y a un grand secret pour être court: c'est d'être clair" (Flourens, 1863, p. 9). Following his advice, I shall try to be brief and, when possible, clear about some aspects of Descartes' actual procedure in the scientific and mathematical realm. This aspect of his career has received surprisingly little attention in spite of the fact that the bulk of his published works and of his correspondence deals with scientific questions. Serious attempts to come to grips with Descartes' science are not to be found before Milhaud (1921) and Mouy (1934), and detailed analysis had to await Koyré (1939), and especially Buchdahl (1969) who offered a brilliant reinterpretation of Descartes' method in which he drew attention to its ambiguities. For instance, although it is generally recognized that Descartes' systematic analysis of motion established the foundation on which the modern science of dynamics is constructed, it is nonetheless the case that a science of mechanics cannot be found in Descartes' writings. This is usually ascribed to the fundamental thrust of his philosophy which concerned itself less with exact quantitative mechanics than with demonstrating the possibility of the mechanical causation of phenomena. But there are several passages in Descartes where he claims to be able to spell out the actual laws of motion but forebears from doing so lest he bore his reader. Many correspondents, who were not unhappy to be spared the technical details, were thus left with the impression that Descartes had provided scientists with an infallible crank to turn out mechanical truths about the physical universe. As late as 1693, Joseph Addison declared in an address delivered in Oxford: "He solved the difficulties of the universe, almost as well as if he had been its architect" (Addison, 1889–1890, VI,

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* The author wishes to thank the SSHRC and McGill University for their generous support of his research.

p. 608). For our purpose, the more interesting passages in Descartes are those in which he seems willing to stake his method on the results of actual observations. The best known instance is a letter written to Isaac Beeckman in 1634 in which he takes objection to his friend's claim that the velocity of light is finite, and argues that it is instantaneous. Descartes writes: "You have such confidence in your observation that you would hold your philosophy false if there was no perceptible delay between sending and receiving a pulse of light. I say, on the contrary, that if such a delay were perceived, the whole foundations of my philosophy would be completely overturned." (Adam & Tannery, 1897–1910, hereafter *A & T*, I, p. 308). Needless to say, although Descartes feared no such overturning, the passage is a forceful reminder of the centrality of the instantaneous transmission of light in his system. "I am so certain of this", he says, "that if it could be shown to be false, I would have to confess that I know nothing in philosophy" (*ibid.*). But Descartes did not restrict his claim to absolute certainty to the case of the velocity of light. A few years later when writing to Mersenne about the circulation of the blood, he boldly asserted: "If what I have written on this, or on refraction, or on any topic that I have treated in more than three lines in my published works is found false, all the rest of my philosophy is worthless" (*A & T*, II, p. 501). This declaration is even more striking when we recollect that writing to Mersenne was in the seventeenth century equivalent to sending a letter to one of our daily newspapers. Letters to Mersenne were copied and distributed as soon as they reached their addressee. Descartes' claim is even more startling when we recollect that he had appropriated Harvey's discovery of the circulation of the blood only as an illustration of the general principle that everything moves in a closed circuit, an idea that was part and parcel of his exposition of motion in a plenum. He turned the heart, not into a pump, but into a tea-kettle in order to derive its heat from known mechanical causes. Whereas Harvey had established the fundamental role of the systole, Descartes' vaporization model led him to argue that it was in diastole that the vaporized blood left the heart. He mechanized Harvey's work but lost the mechanical explanation of cardiac motion in the process! It was indeed shaky ground on which to rest his entire philosophy. Descartes' words have a rhetorical ring and he was probably conscious that he was blowing his own trumpet. One is reminded of Galileo's sweeping claim that all celestial discoveries had been vouchsafed to him and to him alone (Galileo, "Opere", VI, p. 383, n. 13).

Galileo and Descartes had a singularly bizarre notion of the scientific co-operation they professed to encourage. This attitude is explained, in part at least, by the fact that they did not ask, as we do, What is involved in the mathematical description of nature? They asked, rather, the related question, How do we obtain, outside mathematics, the certainty we enjoy within mathematics? Their common answer rested on the denial of the inside/outside dichotomy. There is nothing outside mathematics in the realm of extension. As Descartes put it: "Toute ma Physique n'est autre chose que Géométrie" (*A & T*, II, p. 268). The obvious objection to this assertion is that if physics is geometry, then how can we be certain that it is no more than a clever mental construction. Descartes' reply was that the mathematical style of science is not a mere human contrivance or convention but the very style of nature. But not all physical necessity can be reduced to mathematical rigour, and a certain uneasiness and an occasional tentativeness reveal that Descartes sensed the real difficulty. Why the instantaneous transmission of light, for instance? Two reasons are offered. The first is that Descartes' conception of the world as a plenum, and of matter as extension, entailed that light travelled in an incompressible and inelastic medium in which its action is transmitted instantaneously. If the velocity of light were finite, Descartes would have to reject his theory of matter, the basis of much of his science. The second and related reason is that because the universe is a plenum any actual motion must result in a complete ring of bodies moving together. It follows that to obey the law of rectilinear propagation, light cannot be in actual motion but in what Descartes called, in his "Dioptrics" "an inclination to motion" (*A & T*, VI, p. 88), an instantaneously transmitted pressure in the inelastic medium. Hence if light had a finite motion, it would be necessary to abandon the law of rectilinear motion, and the whole of Cartesian physics would be threatened.

Let us call these two arguments cosmological. They were sufficient in themselves to convince Descartes that light is transmitted instantaneously. But in actual scientific practice, Descartes had to account for the observed phenomena of light, notably the phenomena of refraction for which he formulated (along lines of reasoning that he never explained and that remain obscure to the present day) the law of sines. To explain the action of light, Descartes was driven to employ models that he compared to the epicycles and excentrics of Ptolemaic astronomy while claiming for them a much higher epistemological status. The problem is that Descartes could not work with infinite speeds. The model that he introduced in the "Dioptrics" to deduce the sine law uses the motion and impact of a tennis ball when striking a surface such as water. Descartes supposed that the velocity is greater in a denser medium and that the ball is speeded up as it enters the water. All the change in velocity takes place at the surface and occurs exclusively along the vertical component. From these premises Descartes was able to show that for all angles of incidence at which light is refracted into a second medium, the sine of the angle of incidence is proportional to the sine of the angle of refraction. The result is spectacular, but what of the argument? To some it has appeared "preposterous" (Westfall, 1971, p. 53) and this on two grounds. First, since Descartes asserted that light is "a tendency to motion" (*A & T*, VI, p. 88) transmitted instantaneously, how could he compare it with the successive motion of a projectile? Or for that matter, how could he say that it travelled at different velocities in different media? Secondly, in the case in which the motion was assumed to be swifter in the second medium, Descartes had to imagine that the tennis ball received a second stroke as it touched the surface, a device for which an optical counterpart is difficult to find.

Descartes believed that he could overcome the first difficulty by assuming that the tendency to motion, being a potential movement, follows the same laws a motion itself. This is why in investigating optical reflection and refraction he forgot about the theoretical mechanism of light and studied the reflection and refraction of actually moving bodies. As he puts it in the "Dioptrics": "Now since I shall treat of light only to explain how its rays enter the eye, and how they can be deflected by various bodies they encounter, there is no need for me to say what its true nature is. I believe, it is enough if I use two or three comparisons that will help us understand it in what seems to me the most convenient way, in order to explain all those of its properties that experience has made known to us, and then deduce all the others that are not so easily noticed. In this I imitate the astronomers who, although their assumptions are almost all false or uncertain, yet, because they refer to various observations they have made, draw many conclusions that are true and well-assured" (*A & T.*, VI, p. 83). Descartes, and his readers, were perfectly aware that ancient descriptive geometry had found various ways of reconciling observations with conflicting hypotheses. But it is equally clear that Descartes was not merely offering an instrumentalist account of the nature of refraction. As Gerd Buchdahl points out: "Descartes' approach is more revolutionary, for it employs models, some of which *deliberately* relax the conditions, such as those of infinite speed, which the physical account had demanded; and in doing this, Descartes is further compelled to abandon the original *hypothesis* of stationary ether particles in favour of an emission theory of light particles moving through space" (Buchdahl, 1969, p. 142). Descartes seems to be implying that what is true of the mechanical model (a ball struck by a raquet) will be true of light also, given *a bridging assumption*, in this case that the tendency to motion follows the same laws as motion itself. Worried by the seeming gratuity of this assumption, Descartes sought to vindicate his strategy in the "Discourse on Method", composed shortly after the "Dioptrics", by arguing: "If some of my statements at the beginning of the "Dioptrics" and the "Meteors" seem shocking at first sight because I call them assumptions and display no eagerness to prove them, please read on patiently to the end and you will be satisfied. I believe that the arguments follow one another in such a way that the last are demonstrated by the first, which are the causes, and the first by the last, namely the effects. And do not imagine that I am making the mistake logicians call reasoning in a circle, for experience makes most of these effects quite certain, and the causes from which I deduce them serve not so much to prove as to explain them; indeed, it is the causes that are proved by the effects" (*A & T*, VI, p. 76).

In a sense, this passage heightens rather than lessens our perplexity. Granted that Descartes managed to derive the sine law through reasoning round a model in geometrical fashion and by invoking the motion of projectiles, what causes, if any have been *proven*? The knowledge of the truth of the consequences, i.e. the effect, is not axiomatic but empirical. What seems to be implied is the truth of the bridging assumption, namely that the tendency to motion can be interpreted as following the empirically ascertained laws of motion. But even if this were granted, how does this procedure agree with Descartes' more rationalistic pronouncements, in particular his emphasis on intuitive clarity and mathematical rigour? If we look at the model we cannot claim that the principles governing the motion of a tennis ball are identical with those that explain the transmission of light. All we have is an analogy derived from the fundamental laws of matter in motion; we cannot be said to have found the causal mechanism of the instantaneous transmission of light itself. In other words, the explanatory principles of optics have a purely hypothetical status. But all is not lost. At this point Descartes shifts his ground and claims that his explanation is ultimately deducible from higher principles. In a letter to Vatier, who had expressed surprise that Descartes should introduce assumptions without proving them *a priori*, he replied that *a priori* proofs would have involved an exposition of all his physics, something he had not proposed to do in his "Dioptrics". If required, he could deduce all his suppositions from "the first principles of his metaphysics" (*A & T*, I, p. 563). But Descartes added that "the experiences that are necessarily derived from these suppositions and cannot be derived in the same way from other principles seem to me to be sufficiently demonstrated *a posteriori*" (*ibid.*). Nonetheless, he also claimed that he "demonstrated refraction geometrically and *a priori*" (*A & T*, II, p. 31), and when Mersenne pressed him on this point he replied somewhat impatiently: "to require from me geometrical demonstrations in physics is to ask what is impossible" (*ibid.*, p. 142).

Descartes' problem was the nature of the relation between the requirement that an hypothesis be supported *a posteriori* by verified logical conclusions and the requirement of higher support at the metaphysical level. Although he expressed in 1638 the hope of "showing one day" that the principles of physics are demonstrated by metaphysics (*ibid.*, pp. 141–142), he never succeeded in fulfilling his plan. The "Principles of Philosophy", published in 1644, did not throw much light on the problem and ended with a fideistic rather than a rationalist argument for the validity of scientific reasoning. Article 43 of Part III states: "If we only use principles that are clearly grasped (*evidentissime perpectis*) and only deduce from them what can be arrived at through mathematical reasoning and, furthermore, if what is deduced is in perfect agreement with all the natural phenomena, than we would be making an injury to God were we to entertain the suspicion that the causes of things thus discovered are false, as if he had made us so imperfect that we err in the very process of using our reason correctly" (*A & T*, VIII–1, p. 99). At the very end of the "Principles of Philosophy", and after explaining magnetism in terms of invisible micro-mechanisms, Descartes acknowledged the right to ask how we can reason in terms of unobservable entities. His answer is that "from simple, obvious and naturally known principles" he had worked out the distinctive properties of size, motion and position in bodies, and realized that magnitude, such as is required for sensory perception, is irrelevant. He could then ascribe the macro-phenomena to the operation of invisible entities: "especially", he adds, "when I couldn't think of any other way of explaining them" (*A & T*, VIII–1, p. 326).

In point of fact, Descartes not only reasoned from sensible objects to insensible ones, e.g. from the collision of spheres to the impact of imperceptible elements, he also appealed to human artefacts such as clocks. The justification of this procedure is twofold: on the one hand, there is no essential difference between natural and man-made objects, and on the other, experience teaches us that those who are acquainted with automata can easily conjecture the way an automaton is made merely by being told what purpose it serves and observing some of its parts. "This way we can perhaps understand how natural things could have been made, but we should not conclude that they were actually made in this way. The Supreme Craftsman could have produced all that we see in a variety of ways. I freely admit the truth of this, and I shall think I have done enough if only what I have written is such as to correspond accurately to all the natural phenomena" (*A & T*, VIII–1, p. 327).

The certainty which results from such hypotheses, Descartes called "moral certainty" (meaning adequate for practical purposes) and he compared it to the assurance we would place in the decipherment of a cryptogram that accounted for each sign and yielded intelligible words and sentences. That another key, providing a different solution, should be found is so improbable as to be "incredible" said Descartes. But if he was aware of the problem, his faith in the power of a purely deductive scheme was great enough to make him claim that at least "the more general things" that he had written about physics and astronomy rested on self-evident truths inasmuch as they were integrated in a total deductive system. Ultimately, we have to rely on God's goodness as the guarantee that we cannot go wrong provided we use our intellectual faculties well. This is why the few principles from which we infer true conclusions about magnetism, the properties of fire or the structure of the universe cannot be themselves false (*A & T*, VIII–1, pp. 328–329).

The problem is that Descartes was not satisfied with a mere "hypothetico-deductive" model whereby a scientific theory is considered satisfactory if it meets two conditions: (a) deductive inference from basic principles, and (b) agreement between these deductions and sensory experience. Descartes added a third, infinitely more stringent condition, namely that the principles be self-evident. And, at times, the logical dependence of the premises on the verified consequences appear to entail the incontrovertible truth of these premises. He recognized that there are cases when experience speaks with an ambiguous, indeed a divided voice, but this did not trouble him unduly since he believed that the mechanical approach was true because it was based on the fundamental principle that matter is extension. As Buchdahl puts it: "It is as though he had believed that because the concepts of extension and motion are "clear and distinct", intuitively evident, the hypotheses employing these concepts likewise possess a strength *independent* of their inductive basis" (Buchdahl, 1969, p. 125). But the tension in Descartes' methodological thinking cannot be eliminated. In actual practice, when he denied the kind of self-evident truths that should have been his starting-point, he chose a more or less convincing model by whose aid he proceeded to make deductions from an hypothesis, and to claim that the empirical confirmation of these deductions was a proof of the hypothesis itself.

The tension between Descartes' abstract ideal and his pragmatic achievements is obvious in the way he carried out his program of purging physics from the occult and removing all organic features from science. At the programmatic level, Descartes often tells us that "motion, size, shape and arrangements of parts" ("Le Monde", *A & T*, I, p. 26) are the only explanatory categories. All other properties such as force of attraction and repulsion, sympathies and antipathies, and the like, are relegated to the rubbish-heap of anthropomorphic conceptions. Descartes left no doubt where he stood when invited by Mersenne to comment on Roberval's *Aristarchus* in which two kinds of attractive force were invoked to account for the motion of the earth. To say, with Roberval, that all particles of matter in the universe attract one another and that the parts of the earth attract each other with a special property implied, according to Descartes, that particles of matter are animated by two souls and "that these souls are intelligent and, indeed, divine, since they are able to know without intermediary what is happening in places far removed from them, and even to exercise their forces there" (*A & T*, IV, p. 401).

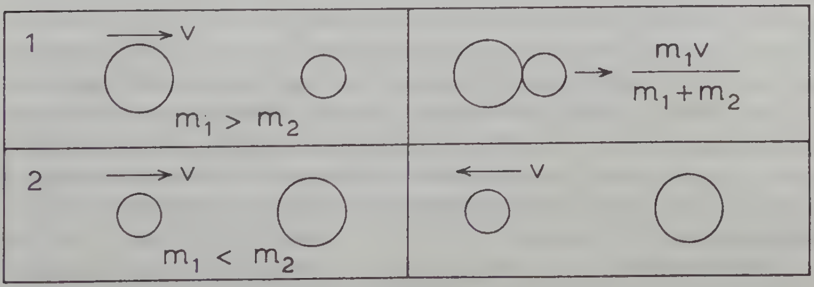
Roberval argued, of course, that without attraction many natural phenomena and specifically the solar system could not be explained. Descartes had to show that they were superfluous and that a purely mechanical interpretation of motion accounted for all known facts. He saw his greatest triumph in the successful reduction of the most conspicuous case of attraction, namely the action of the loadstone, to the motion of invisible screw-shaped particles. Descartes' fundamental objection to "attractive forces" and "sympathetic relations" is that these conceptions are not evident. He makes this programmatic point in Rule XII of the "Rules of the Direction of the Mind": "there is nothing to be known in the magnet that does not consist of certain simple natures, known in and by themselves" (*A & T*, X, p. 411).

In translating this idea into actual practice, Descartes virtually identified causal explanation by imaginary mechanism with the science of mechanics. Without precise mathematical laws to guide him in framing his micro-mechanisms, he assumed that they were miniature reproductions of those we know at the macroscopic level. Hence the man who began "Le Monde" with a vivid demonstration that physical reality differs from the world of experience ended with a representational model as the first requirement of a mechanical explanation. Descartes had a vivid imagination and readily imagined particles suited to the shape and motion of any desired phenomena. For instance, the ease with which heat or wind drives water out of bodies shows that particles of water are long and flexible, and the sharp taste of acids indicates that their particles were repeatedly battered by particles of fire until they acquired a flat and cutting edge.

Descartes rushed headlong into this microscopic world of hidden mechanisms. The lack of a criterion to judge the validity of postulated explanations did not strike him as a liability since he thought he had devised invisible mechanisms that would account for the most mysterious and allegedly occult forces in nature such as showers of blood, milk, flesh, stones, and even animals from the air. (*A & T*, VI, p. 321). The French translation of the "Principles of Philosophy" even offers a mechanical explanation of why the wounds of a murdered man bleed when the murderer approaches (*A & T*, IX–2, p. 369).

Purging matter of organic features led to a deeper and more significant result. Cleansed of all organic features, hence of all internal forces, matter appears, in several of Descartes' pronouncements, as wholly inert. It is indifferent to motion or rest. It follows that bodies have no force to resist motion. The idea that matter contains such resistance is a prejudice, "founded", as Descartes explained to a correspondent, "on our preoccupation with our senses, and derives from the fact that having tried since our infancy to move only bodies that are hard and heavy and having always experienced difficulty, we have been persuaded since then that the difficulty proceeds from matter and is consequently common to all bodies. This was easier for us to suppose then to realise that it was only the weight of the bodies we tried to move which prevented us from lifting them, and the hardness and uneveness of their parts which prevented us from pulling them, and hence it does not follow that the same thing must happen with bodies that have neither hardness nor weight" (Descartes to Morin, 13 July 1638, *A & T*, II, pp. 212–213).

A consequence of the indifference of matter to motion is drawn by Descartes when he states that bodies have to move with a finite velocity. Motion and rest are discontinuous and a body starting to move does not pass through all the degrees of speed as Galileo maintained. In practice however, Descartes was faced with the fact, as he himself recognized, that "size is always opposed to speed" ("Le Monde", *A & T*, XI, p. 51). But if matter is wholly inert how can size oppose velocity? The problem was not raised in "Le Monde" but it was thrust to the force in the "Principles of Philosophy" when Descartes sought to formulate the rules that govern motion in the light of the guiding principle that motion is a state and not a process. Let us consider two such rules.



When a body *A* strikes a body *B* at rest and sets it in motion, the two bodies move together with a common velocity such that the quantity of motion of the two equals the quantity of motion that A had before impact (Rule 1). But if *A* is unable to move *B* it rebounds, its velocity unchanged and its direction reversed (Rule 2). The relative size of the two bodies determines whether *A* can move *B*; if *B* is larger by any amount whatever, *A* will not be able to move it. At this point, the natural thought occurred that *B* at rest remains a constant factor whereas the force of *A* can increase indefinitely as its velocity increases. The more he examined the problem, however, the more Descartes was convinced that *A* can never move *B* whatever *A*'s velocity. In the Latin edition of the "Principles of Philosophy", he merely stated the rule. In the French translation that appeared three years later in 1647, he explained the reasoning behind it: *A* cannot push *B* without making it going as swiftly as *A* itself would go afterwards, and *B* must resist so much the more as *A* comes towards it more swiftly. Thus, for example, if *B* is twice as large as *A*, and *A* has three degrees of speed, *A* can only push *B* if it transfers two-thirds of its speed to *B*. If *A* has 30 degrees of speed, it must transfer 20 to *B*; if 300, it must give 200, and so on. But since *B* is at rest, it resists the reception of 20 degrees ten times more than 2, and 200 degrees a hundred times more. So the greater the speed of *A*, the more resistance it finds in *B*. ("Principes de philosophie") (*A & T*, IX, 2, pp. 90–91).

Since Descartes treated the change of motion as instantaneous, the resistance he attributed to matter had to be resistance to motion itself and not merely to change of motion. The resistance to motion that Descartes admitted cannot be reconciled with the inertness that he considered an essential property of matter. The fact that this incompatibility escaped Descartes gives us an idea of the magnitude of the conceptual change involved in the ontological identification of motion and rest. In his *First Law of Nature*, Descartes affirmed that motion, like rest, is a *state* not a *process* and hence that motion continues uninterrupted unless forced to change by some outside agent. Combined with his *Second Law of Nature*, "that all motion is of itself straight", we have – in all appearance – a clear statement of the principle of inertia. That this is not the case can be seen in the way Descartes did not focus on change of motion but on steady motion. Whereas, after Newton, we think of free fall as a model of force, namely a paradigmatic case of an external action changing a body's inertial state, Descartes thought of force in terms of the model of the collision of two balls.

We have already seen how Descartes called upon God to vouchsafe the reliability of our knowledge of the external world. He now appealed to the simplicity and immutability of God's action to justify the *Second Law of Nature* according to which a body in motion tends to continue moving in a straight line: "This rule . . . only depends on God conserving each thing by his continuous action, hence at the very instant that he conserves it. It so happens that among motions, only straight motion is entirely simple and such that its nature is comprised in an instant" ("Le Monde", *A & T*, XI, p. 45).

A stone rotating in a sling allowed Descartes to consider several causes at work. If the stone is considered as attached to the string it may be said to tend along a circle, but if only its "agitation" is considered, then it clearly tends along the tangent. But there is a third possibility: if we consider only that part of its "agitation" which is impeded by the string, then we can say that the stone "tends . . . or endeavours to recede from the centre" radially outwards along a straight line ("Principia", *A & T*, VIII–1, p. 109; see the earlier version, "Le Monde", *A & T*, XI, p. 85).

In the "Principles of Philosophy", we find two further illustrations. In the first, a ruler turns about one end while a fly crawls outward along its edge. In the second, a ball is placed in a hollow tube, and as the tube rotates around one of its ends, the ball moves lengthwise in it away from the centre of rotation. It is in the latter example that we see most clearly Descartes' conceptualization of the problem. The ball inside the rotating tube is receding from the centre, and if the tube should cease to check it it would move uniformly along the tangent and recede obliquely from the centre.

Descartes does not focus his attention on the external constraint or force necessary to divert a body from its inertial path, but on the internal effort or force exerted by the body thus constrained. The importance of Descartes' conceptualization of the problem cannot be overestimated. Every significant investigation of circular motion in the generation after Descartes began with a consideration of the force away from the centre. Huygens coined the term centrifugal force to express the force exerted by a body constrained in circular motion. After Newton, we now say that a centripetal force must be applied to constrain a body in circular motion. Although these two descriptions are quantitatively identical, they are conceptually poles apart. But there is an apparent naturalness to Descartes' approach. Indeed it appeared so obvious to the next generation that no one thought at first to question it.

Descartes did not, therefore, measure the force by the change of motion it causes. He concentrated his attention on the force a particle has to act, and, in the case of circular motion, on the force by which a particle strives to move away from its centre of revolution. From our vantage point, Descartes' two first laws of nature, taken together, assert the vectorial nature of inertial motion. A body will continue to move in a straight line until some external agent acts upon it. As far as motion is concerned, a change of direction is as signficant as a change of speed.

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Once the idea of rectilinear inertia is assumed, a workable dynamics requires that both changes be reduced to the same quantitative measurement of action. Descartes, however, distinguished between the force of a body's motion and its determination. Writing to Mersenne in 1640 he stated: "properly speaking force is only needed to move bodies and not to determine the direction in which they ought to move" (Descartes to Mersenne, June 1640, *A & T*, III, p. 75). By drawing this distinction, Descartes left changes of direction in the anomalous status of changes that are not changes, changes that involve no act. But for Descartes the anomaly was merely apparent, since the instantaneous change of direction is an indication of the way God conserves the same quantity of motion from one instant to the next. There is also a more mundane advantage: if change of direction does not involve a change of force, physics is greatly simplified. In particular, there follows an important bonus for Descartes' cosmology: the particles of subtle matter must move almost always with the greatest velocity. They are thus able to receive from larger bodies without suffering a reciprocal loss of force. Hence, in the end, motion in a world where there is no void must be circular. There is an equilibrium of forces for there is no infinite void where inertial motion could, in principle, go on for ever and ever. This is why Descartes slipped naturally into a conceptual scheme that treated the tangential path as the resultant of circular motion and a radial tendency away from the centre. Circular motion acquired a virtually natural status as a state of equilibrium between whatever constraint exists to turn bodies into a circular path and the force bodies exert against it. The methodological ideal works in wondrous ways marvels to perfom! And the greatest marvel is that Descartes' subtle move went unchallenged until Newton.

References

Adam, Charles and Tannery, Paul, 1897–1913, "Œuvres de Descartes", 12 vols. and index. Léopold Cerf, Paris.

Addison, Joseph, 1693, "Nova Philosophia Veteri Praeferenda Est", in: "The Works of the Right Honourable Joseph Addison", with notes by Richard Hurd. New Edition 6 vols. 1889–1890, George Bell and Sons, London.

Buchdahl, Gerd, 1969, "Metaphysics and the Philosophy of Science", Blackwell, Oxford.

Favaro, Antonio (ed.), 1890–1909, "Le Opere di Galileo Galilei", 20 vols. G. Barbera, Florence.

Flourens, Philippe, 1863, "De la phrénologie", Garnier, Paris.

Koyré, Alexandre, 1939, "Etudes galileénnes", Hermann, Paris.

Milhaud, Gaston, 1921, "Descartes savant", Félix Alcan, Paris.

Mouy, Paul, 1934, "Le développement de la physique cartésienne", Vrin, Paris.

Westfall, Richard S., 1971, "The Construction of Modern Science", John Wiley and Sons, New York.

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DESCARTES, THE ARISTOTELIANS, AND THE REVOLUTION THAT DID NOT HAPPEN IN 1637

Descartes is, for us, the father of modern philosophy, the figure with whom the history of *our* philosophy begins, the philosopher who ended scholasticism once and for all and turned aside the excesses of Renaissance thought. And the *Discours de la méthode* and *Essais* is the work in which Descartes seems to have declared his revolution, and announced to the world his independence from the history of philosophy. In the opening pages of his first published writing, Descartes wrote:

> As soon as age permitted me to free myself from the control of my teachers, I left the study of letters altogether. . . . For it seemed to me that I could find much more truth in the reasonings everyone makes concerning the matters important to him . . . than in those which a man of letters makes in his study. [AT VI 9][1]

And so, Descartes tells his readers, he decided to leave school, and to seek knowledge not in the classroom, but "in myself, or else in the great book of the world." [AT VI 9] He urges us to do likewise, presumably, to abandon tradition and follow him into the new world of the mechanical philosophy, the world to which his travels eventually lead.

Audacious words for a young man to have written in his first venture onto the public stage. One wonders how "the men of letters" against whom these remarks were directed reacted to these words, and to the words that followed, to the method Descartes proposed, to the program for knowledge and the sciences he outlined in the *Discours* and to the results of his work that he presented in *La Dioptrique*, *Les Météores*, and *La Géometrie*.

One wonders. Scholars have given considerable attention to questions that concern Descartes' attitudes toward his teachers and what they taught him, the extent to which he rejected the intellectual tradition in which he was trained, the extent to which he drew elements of his own thought from that tradition. But these are not the issues that concern me here. What interests me is, in a way, the converse of these questions, not how Descartes reacted to the Aristotelian philosophy of the schools, but how the Aristotelians against whom the *Discours* and *Essais* are directed reacted to Descartes at the moment when his philosophy first appeared. By the end of the 17th Century it was obvious that what Descartes had started in 1637 had become one of the main programs in the new philosophy, and, if not the strongest, then at least one of the most visible nails in the coffin of the old Aristotelian philosophy. But how did the revolution Descartes seems to have called for in 1637 look on the ground and in the trenches? How did it look to the people whose authority Descartes seems to have been challenging?

Descartes circulated copies of his volume widely; writing to Mersenne in March 1636, a bit more than a year before its publication, Descartes contemplated needing "at least two hundred copies, since I would like to distribute them to a number of persons" [AT I 339] Many of these copies went to the very people he would seem to have been attacking, including teachers at La Flèche, Louvain, Lille, and Paris.[2] Indeed, Descartes had originally hoped to gather together the letters he received from these people, and publish them, together with his responses, as he was later to do with his *Meditationes.*[3] But Descartes reported few reactions from the gentlemen of the schools. Writing to Huygens in March 1638, he noted:

> As for my book, I don't know what opinion the men of the world will have of it, but as for those of the schools, I hear that they are silent, and upset that they cannot find enough of a handle for their arguments there, they content themselves with saying that if what it contains is true, then all of their philosophy must be false. [AT II 48][4]

One suspects that Descartes was disappointed and somewhat hurt that his former teachers at La Flèche did not make enough of a fuss about his grand new book.[5] But despite what Descartes wrote to Huygens, there were interesting responses from the schools. Though it would be nice to have had more of a response from the Aristotelian community, letters that were never written, thoughts that were not thought for lack of time or interest, enough comes down to us to get a fairly good idea of the initial reaction of the Aristotelian community to Descartes' project; that is what I would like to discuss here.

There is not time to discuss all of the correspondence Descartes had with members of the Aristotelian community in the months and years that immediately followed the publication of the *Discours* in 1637. Instead I shall focus on the reaction of two correspondents, Libert Froidmont and Jean-Baptiste Morin. Neither is a "typical" Aristotelian (whatever that is) nor, perhaps, can either be considered entirely typical of the Aristotelian reaction to Descartes' first writings. But together they give us a fair idea of how some of the more conservative elements in the European intellectual world reacted to the philosophical revolution Descartes announced in 1637.

1. Libert Froidmont: Descartes and the Atomists

I would like to begin the project with a brief examination of Libert Froidmont, or Libertus Fromondus, as he called himself in Latin.

Libert Froidmont, born in 1587, taught at the University of Louvain, first rhetoric (1609–1614), then philosophy (1614–1628), and then, after receiving his doctorate in 1628, he taught theology until his death in 1653.[6] Much of Froidmont's interest was theological. By 1637, the year in which he read and commented on Descartes' work, he had already occupied Jansenius' chair in Sacred Scripture for three years, since 1634.[7] Long associated with Jansenius, he participated in the publication of a number of his posthumously published works, including the important *Augustinus* of 1640.[8]

But as important as Froidmont may be for the history of Jansenism, it is Froidmont the natural philosopher who interests me here. Froidmont did write a tract on atmospheric phenomena, the *Meteorlogicorum libri VI* (Anvers, 1627); this, no doubt, motivated some of his interest in Descartes' *Météores* and the specific attacks he made on that work.[9] But his commitment to the old ideas and suspicion of the new is best shown in two of his projects, his attempted refutation of Copernicanism, and his attempted refutation of atomism.

While Froidmont's opposition to Copernicanism and support of the Tychonic system go back to his early years as a teacher of philosophy,[10] his views on the immobility and centrality of the Earth are argued at greatest length in his *Ant-Aristarchus* of 1631, a polemic directed against the Copernican, Philippe van Lansberge, and, in 1634, in a reply to Jacques van Lansberge's defense of his father.[11] In these works, Froidmont gathered together a number of arguments to support the traditional view that the Earth is immobile at the center of the universe. Froidmont's arguments are, in general, unoriginal, standard arguments found in a variety of sources.[12] Despite this fact, Galileo regarded the *Ant-Aristarchus* as "the most sensible and the most capable of those [anti-Copernican tracts] that I have seen until now."[13]

The same year Froidmont published the *Ant-Aristarchus*, 1631, he also published a book called *Labyrinthus siue de Compositione Continui Liber Unus* (Antwerp, 1631). This work is best known today through Leibniz, who adopted Froidmont's figure of a labyrinth in connection with the continuum problem, and who often recommended Froidmont's book as a valuable compendium of arguments and problems relating to the issue of the composition of the continuum.[14] It is that, to be sure. But it is also, in fact, it is *primarily* an attack on the newly revived Epicureanism. A number of European philosophers had been toying with varieties of ancient atomism since the rediscovery and publication of Lucretious' atomist poem *De Rerum Natura* in the 15th Century and the first publication of the fragments of Epicurus found in Diogenes Laertius. By the early 17th Century there were real schools of Epicureans, and published books advocating the revived atomism, including books by Nicholas Hill and Sebastian Basso, and there were others, like Pierre Gassendi, about to publish their atomist tracts.[15] So too, there seem to have been atomists at Louvain, and it is against these atomists that Froidmont directed his arguments in the *Labyrinthus.*[16] In the preface to the *Labyrinthus*, Froidmont tells the reader that the book is directed against those, found even at Louvain, "who have deserted Aristotle, Plato, Zeno, that is, those great men of illustrious fame and erudition of the schools, and have fled to Epicurus. . . ."[17] The attack against the atomists at Louvain was continued in a pamphlet from 1636, *Libertus Fromondus causae desperatae Gisberti Vöetii crisis.* There, in response to an attack on him by Gisbert Voët, the same who was later to raise a storm against Descartes and Cartesianism, Froidmont did his best to distance himself from the "Lovanii Democriticorum atomorum defensores," a group to which Voët had accused Froidmont of belonging.[18] While atomism may have infected the imagination of many early 17th Century thinkers, Froidmont was not among them; to him it was an unfortunate contagion, a view that could only have arisen through ignorance or neglect of the school philosophy, which soundly refutes it in all its versions.

When the physician Plemp at Louvain received from Descartes three copies of his newly published *Discours* in late August 1637, a month or so after they first appeared, one copy went immediately to his collegue Libert Froidmont. [AT I 399]. Within three weeks, on 13 September 1637, Froidmont had a fat letter to transmit to Descartes, a letter containing his frank assessment of Descartes' thought. [AT I 402f]. Descartes was surprised (and delighted) to get a response so quickly [AT I 410]; he had a reply back to Froidmont by 3 October, just a few weeks after Froidmont sent his letter. [AT I 412f] Froidmont did not reply to Descartes' comments on his letter, so here the correspondence ends. But short as it was, Descartes seemed to think that it was a good exchange, one in which important questions were raised and answered, for copies of the exchange seem to have been made and quickly circulated to the curious.[19]

Froidmont was not altogether uncomplimentary in his letter; "I admire his temperament for the most part" he says at the beginning of the letter, and at the very end, grants that, his criticisms aside, Descartes is "quite talented, with enormous drive and diligence.'' [AT I 402, 408] But between these two statements, Froidmont is quite blunt in his judgment of the work.

What offended Froidmont was precisely what pleased Descartes the most, the extent to which physical phenomena were explained mechanically in the Cartesian world, accounted for in terms of size, shape, and motion. While Froidmont offered a fair number of criticisms (eighteen in all), the most interesting break down into two main groups. Froidmont first objects to Descartes' basic premise, that inanimate bodies are made up of smaller parts, whose size, shape, and motion explains their manifest properties. [cf. AT VI 233]. Froidmont objects: ''this composition of bodies from parts of different shapes seems excessively crass and mechanical.'' [AT I 406] Froidmont takes it to be absurd on the face of it that a calm lake might, upon closer inspection, be a teaming tangle of eel-shaped corpuscles. [AT I 406] Furthermore, he offers an objection, standard among opponents of atomism, that while the interlocking of corpuscular hooks may explain the coherence of bodies, we must posit smaller bodies with smaller hooks to explain the coherence of the first hooks posited, and so on *ad absurdum*. [AT I 406]

But Froidmont was even more offended by Descartes' use of mechanical explanation in living organisms, a theme that links a second main group of objections. One of Descartes' great ambitions was to eliminate the Aristotelian account of nutrition and sensation in terms of appropriate souls, and explain all but the rational faculties of living things in terms of mechanical causes. Froidmont would have none of that. To the claim that animal heat is capable of bringing about all vital non-rational operations of the animal, including vision and hearing, without the need of a soul, Froidmont replied that ''it seems that such noble operations cannot derive from such an ignoble and brute cause.'' [AT I 403][20] Such mechanism is not only crass and wrong, for Froidmont, but genuinely dangerous: ''from this extends, perhaps, the road to the atheists.'' [AT I 403] If we can explain all of these complex aspects organisms mechanically and without appeal to a soul, then, Froidmont worries, someone may eventually get the idea that we can explain absolutely everything, rationality included, in these terms, and then we would be in some serious difficulty.

Froidmont's criticism is stern and uncompromising.[21] But it is interesting, and important to note that Froidmont saw nothing in Descartes' views that was particularly original. What Froidmont saw in Descartes was yet another renovator of the ancient atomism, not unlike other misled souls he had had to deal with earlier in his career, the targets of his *Labyrinthus*, and no doubt, companions in many hours of heated debate at Louvain.[22]

Froidmont wrote, at the opening of his letter: "Not rarely does he [Descartes] unknowingly fall into the physics of Epicurus, I think, crude and overblown." [AT I 402] Like Ixion, Froidmont claimed, Descartes thinks he has Juno herself in his arms, when he has only a cloud. [AT I 402] Even Descartes' most radical comments are interpreted in this spirit. Noting Descartes' rejection of his education, his resolution to leave school and seek knowledge in himself and in the world, Froidmont writes:

> I seem to see a Pythagoras or a Democritus, a voluntary exile from his homeland who has traveled to the Egyptians, to the Brahmans, and around the entire globe, to investigate the nature of things and the nature of the universe. [AT I 402]

What Froidmont saw in part I of the *Discours* was not the radical rejection of the past, but a link to the tradition of the ancients, to Pythagoras and Democritus, who, legend has it, traveled widely in the ancient world in search of wisdom.[23]

Descartes, of course, objects. Recalling Froidmont's appeal to the fable of Ixion, Descartes points out that it is Froidmont and not he, Descartes, who is caught holding the cloud.

> . . . .while he thinks that he opposes my philosophy, he refutes nothing but that insubstantial amalgam of atoms and the void which is usually attributed to Democritus and Epicurus, as well as other similar things, which do not in any way belong to me. [AT I 413; cf 416–17]

Descartes was right, of course. He was a mechanist and did not hide that fact, even in responding to Froidmont [AT I 420–21]. But he was also quite clear in rejecting both atoms and the void, the *sine qua non* of atomism, in the very writings Froidmont is supposedly discussing, the *Dioptrique* and the *Météores*. [cf. AT VI 86, 239; AT I 422] Furthermore, unlike the Epicurians, at least, Descartes believed quite unambiguously in an incorporeal soul and an incorporeal God who created the world and took an interest in his creation, something Froidmont should have learned from part IV of the *Discours*. While Descartes certainly knew something of ancient atomism, and may have borrowed elements of it, he was no member of that school. Indeed, he was attempting to forge a kind of mechanism that incorporated Aristotelian elements, like the denial of a vacuum and the infinite divisibility of matter, a mechanical philosophy that fell outside of the traditional categories.

But be that as it may, what is interesting to me here is the fact that Froidmont seems to have seen none of this. What he saw was the shade of Epicurus *redivivus*; he immediately assimilated Descartes to a familiar category, and associated him with the renovators of ancient atomism that he knew so well. For Froidmont, Descartes comes out doubly unoriginal, unoriginal insofar as the view he advances is just a version of an older view, a view that Aristotle wisely disposed of before Epicurus even advanced it, and unoriginal again insofar as the view was unwisely revived by many before Descartes advanced it. The haste with which Froidmont responded to Descartes *may* be explained by the fact that the criticisms he offered were basically warmed-over versions of the same criticisms he offered in print and in conversation to his atomist colleagues at Louvain.

2. Jean-Baptiste Morin: Descartes as Conservative

I shall now leave Froidmont aside and turn to the second figure I would like to examine here, Jean-Baptiste Morin.

Morin was Professor of Mathematics at the Collège de France from 1629 to 1656, and worked mainly in astronomy and astrology. As an astrologer he cast horoscopes for many prominent people of his day, and offered theoretical justification of the practice.[24] As astronomer, he was responsible for a sophisticated but, unfortunately, utterly impractical method for computing one's position at sea that never was put into practice.[25] But Morin also had other interests in natural philosophy.

Like Froidmont, Morin also opposed Copernicanism in favor of the system of Tycho, and like Froidmont, published (against the advice of Mersenne and Gassendi) a tract against van Lansberge *père* in 1631, followed by a tract against van Lansberge *fils* in 1634.[26] Descartes, by the way, seems to have known of these works through Mersenne, although he did not think especially well of them. [AT I 258, 324] Writing to Mersenne in summer 1632 concerning the first of the two, Descartes remarked that he should feel quite sorry for the age "if I were to think that those who wanted to make an article of faith [of the immobility of the Earth] did not have any better reasons for holding it." [AT I 258; cf. 324] Galileo also knew of Morin's writings against Copernicus, and linked Morin with Froidmont, naturally enough, wishing that he had both authors in hand before his *Dialogo* went to press so that he could discuss them there.[27]

Also like Froidmont, Morin was firmly opposed to some of the innovations that were starting to replace Aristotle in certain intellectual circles. Morin's view comes out most clearly in a pamphlet he published in 1624, *Refutation des theses erronees d'Anthoine Villon . . . & Estienne de Claues . . .* (Paris, 1624). The work is polemical, directed at refuting a group of anti-Aristotelian theses put forward in 1624, theses that resulted in one of the most important episodes in French intellectual life in the opening decades of the 17th Century, the official condemnation and exile of the brash scholars who posted them.[28] But the subtitle Morin added suggests the general significance of the pamphlet for his thought: " . . . where the true principles of bodies and numerous other nice points of nature are eruditely treated, and the solidity of the doctrine of Aristotle is proved."

As the subtitle suggests, the work is a defense of Aristotle and orthodoxy. In his dedicatory letter, he declares "that there is nothing more seditious and pernicious than a new doctrine: I say this not only in theology, but even in philosophy."[29] The doctrine he means to support in his pamphlet is the old and well entrenched philosophy of Aristotle, "which the Church fathers sanction above all of the others, and which they use in ordinary practice for their discussions of essence, substance, accident, matter, form, efficient cause, and effect."[30] The anti-Aristotelian views that Morin is opposing in his pamphlet are sketched in 14 theses, theses that Morin gives in his text. These theses are not altogether coherent.[31] But among them are some doctrines clearly recognizable as components of the new mechanist world-view. For example, theses I–III deny the Aristotelian three principles of physics, (prime) matter (thesis I), substantial form (with the exception of the human soul) (thesis II), and privation (thesis III).[32] The final thesis (thesis XIIII) also contains the remark that the doctrine of atomism, the doctrine that "everything is composed of atoms or indivisibles was ignorantly or rather maliciously scoffed at by Aristotle" and goes on to say that this doctrine "is in conformity with reason, the true philosophy, and the internal make-up of bodies."[33] Morin responded by offering a vigorous defense of the doctrines of matter, form, and privation, claiming that "matter and form united constitute the essence of body *qua* body."[34] Morin does not directly attack ancient atomism in this pamphlet; it suffices for his purposes there to argue that the atomism his opponents offer is not at all the doctrine that either Democritus advanced or Aristotle refuted.[35] But given the emphasis Morin placed on substantial form and (Aristotelian) matter, one would hardly imagine him to have approved of genuine atomism. Though these views so apparently hostile to the new philosophy date from 1624, thirteen years before Descartes' new philosophy was to be published, I see no reason to believe Morin had changed his basic views. As we shall see, in reacting to Descartes and the newly published *Discours*, Morin remains the Aristotelian. and he continues to be the Aristotelian into the 1640s and 1650s, when he enters into dispute with Pierre Gassendi over the issue of atomism.[36]

Morin's exchanges with Descartes on the *Discours* and *Essais* begin on 22 February 1638, four months or so after the exchange with Froidmont had ended so abruptly, and they extend through a total of three letters on Morin's part, and two letters on Descartes' part to October 1638, when Morin wrote his last contribution to the exchange, a letter that Descartes declined to answer.[37] Morin discusses a number of important issues in his letters. Like many others, Morin was not happy with the use of suppositions in the *Dioptrique* and *Météores*, nor was he happy with the justification Descartes offered of that practice in the *Discours*. [AT I 537–540][38] The substantive criticisms Morin offered concern mainly Descartes' account of light. His interest in Descartes' account is quite general and the criticisms he presents cover a fair bit of material. But one theme runs through many of Morin's remarks and many of his letters. Descartes' view in the *Dioptrique* is that light is simply "a certain motion, or a very rapid and strong action" of the subtle matter. [AT VI 84][39] Morin objects, arguing over and over again that there must be something more to light (luminescence) than motion or action; motion or action require a prior cause, and it is this prior cause that is light, properly speaking.[40] Ultimately, Morin presses Descartes to admit a "faculté d'illuminer," a faculty distinct from motion or action, a faculty of light which is the cause of that motion or action. [AT II 296] In this "faculté d'illuminer" Descartes sees a dreaded substantial form, and insofar as it differs from the matter that makes up the sun and its qualities, it is for him "a philosophical being which is unknown to me." [AT II 367]

The content of this exchange is interesting, to be sure. But what is more interesting to me here is a different and somewhat more subtle feature of the correspondence. Morin was as much of an opponent of the new philosophy as Froidmont was, and, as we have seen, was particularly sensitive to innovators who were attempting to overthrow the Aristotelian tradition. But unlike Froidmont, Morin did not place Descartes among the opponents of tradition. Indeed, quite to the contrary, Morin considered Descartes to be not all that different from himself, in a certain sense. In his first letter to Descartes, 22 February 1638, Morin wrote:

> I do not know, however, what I should expect from you, for I have been led to believe that should I discuss matters with you using the terms of the schools ever so little, you would immediately judge me more worthy of scorn than of response. But in reading your discourses, I find that you are not as much of an enemy of the schools as you are made out to be. [AT I 541]

Morin continues with some remarks about his own view of the schools:

> The schools appear to me to have erred only insofar as they are more occupied in speculation directed toward the search for the terms which we must use to discuss things, than they are in the search for the truth itself about things through good experiments; so they are poor in the latter and rich in the former. That is why I am like you in this matter; I seek the truth about things in nature alone, and I no longer put my trust in the schools, which serve me only for terminology. [AT I 541]

Morin may not be altogether candid with Descartes (or with himself) when he says that he follows the schools in terminology alone. As I noted earlier, Morin does follow the Aristotelian line on the immobility of the Earth and on the importance of matter and substantial form to physics. And furthermore, as the later letters demonstrate, the adoption of Aristotelian terminology can bring with it doctrine as well. Indeed, the discussion of Descartes' theory of light is in no small way affected by the fact that Morin sets the discussion in scholastic terms, demanding the *form* of light [AT I 541, 544], its *matter* [AT I 544–45], the *mover* of Descartes' subtle matter [AT I 545], and the *form* of its motion [AT I 546]. It is the Aristotelian way Morin sets his questions that leads him to the view that one cannot have "motion without a mover, which is its efficient cause" [AT II 294], and from there on to the view that the sun must have a "faculty for acting," distinct from motion, a faculty which is the cause of light. [AT II 296]. But Morin's view of himself is as one of the moderns, after a fashion. His eyes are open to new experiences, and his mind is open to giving up Aristotle when he is wrong. At the same time, though, he holds that we should not be too quick in rejecting the tradition; he sees the *basic framework* he inherited from the school philosophy as sound, and challenges only the details when they come up against experience. Morin considered himself a progressive conservative, an Aristotelian in a broad sense, not a narrow one, like some of his contemporaries.[41] *And Morin seems to have placed himself and Descartes in the same category*: "I am like you in this matter" [AT I 541]. Though it might not be evident at first glance, Morin felt confident that with a little bit of reworking Descartes' ideas could be made to talk the language of the schools, and enter into the dialogue among Aristotelians of various sorts.

Now, Descartes could be rather explicit in rejecting not only the doctrine of the Aristotelians, but their terminology as well. For example, in *Le Monde*, written a few years earlier than the *Discours* and *Essais*, Descartes quite openly poked fun at the "prime matter of the philosophers" and their notions of motion. [AT XI 33, 35–36, 38–40] Although Descartes had not published *Le Monde*, it is not surprising that he had the reputation of a person hostile to the school philosophy in every respect. But Descartes used a very different strategy in the *Discours* and *Essais*. Immediately after denying that there are atoms, Descartes added:

> Then, you should also know that, so as not to disrupt the peace with the philosophers, I do not in any way want to deny that which they imagine in bodies over and above what I have said, like their *substantial forms* and their *real qualities*, and similar things. But it seems to me that my arguments ought to be better received the fewer things I make them depend upon. [AT VI 239]

Descartes' remarks to Regius in January 1642 suggest that this policy was followed not because he thought that these notions had any validity, but only "so that [I] would not irritate anyone with harsh words." [AT III 491–92]. But be that as it may, in replying to Morin's first letter, Descartes continued to write for the most part in the same conciliatory tone he used in the *Météores*. Descartes wrote in his reply to Morin's first letter, 13 July 1638:

> As for the scorn which you have been told I hold toward the schools, it could only have been imagined by those who know neither my ways nor my temperament. And even though in my essays I have scarcely used these terms, which are only known by the learned, this is not to say that I disapprove of them, but only that I had desired to make myself understood by others as well. [AT II 201–02]

Descartes then went on to use selected scholastic terms of art in an ostentatious way, "so that you will not judge that I scorn them," he told Morin. [AT II 205; cf also 203.30, 207.12]

Morin (and Mersenne as well) were delighted with Descartes' reply. On 1 August 1638, Mersenne wrote to Descartes:

> We read your answer together, and M. Morin found your style so fine that I advise you never to change it. . . . Furthermore, in the answer to M. Morin, you gave a good demonstration of the fact that you do not scorn, or at least that you are not ignorant of, Aristotle's philosophy. This has contributed to the increase in the esteem that M. Morin testifies that he has for you. This is also what I assure those who, fooled by the clarity and easiness of your style (which you know how to lower to make it intelligible to common people), believe that you do not understand scholastic philosophy at all. But I make them understand that you know it as well as the masters who teach it, and who appear the most puffed up with their cleverness. [AT II 287]

For Morin, the explicit rejection of authority, the rejection of the schools and everything taught there, the call to tear down the edifice of knowledge and rebuild our beliefs anew, the revolutionary words and images that open the *Discours*, these pass by apparently unnoticed and certainly not commented upon. What did not pass unnoticed was the rather more subtle way in which Descartes was consciously attempting to ingratiate himself to the philosophers of the schools, the careful way in which he avoided explicit attacks on their specific doctrines or terminology, a feature of the *Essais* that Descartes was quite happy to reinforce in his replies to Morin. As the correspondence continues, the positions of the two philosophers come more sharply into focus, and their differences become clearer. It is no surprise to the careful reader of those exchanges when Descartes confides in Mersenne on 15 November 1638 that "between us, it seems to me that his thoughts are farther from mine than they were at the start. . . ." [AT II 437] But it is also not surprising that at the beginning, at least, Morin would have seen in Descartes a kindred spirit, one open to the new without being hostile to the old, a progressive traditionalist like himself.

3. The Revolution that Did Not Happen in 1637

In the previous sections I have called attention to some curious aspects fo the correspondence between Descartes and Morin, and Descartes and Froidmont, the two members of the Aristotelian community I have chosen to study. What my preliminary examination suggests is that for these readers, at least, Descartes was *not* perceived as doing anything in the least bit revolutionary.

For Froidmont, Descartes was merely the reviver of an ancient system of thought, atomism. Furthermore, Descartes was not even original in wanting to revive this particular ancient system of thought. From Froidmont's point of view, Descartes was just another faddish scholar who wanted to revive atomism, a sort well known to him at Louvain, against whom he had already written at some length. In the case of Froidmont, Descartes did not *cause* an uproar; he simply landed in the middle of one that had been going on for years at Louvain and elsewhere. For Froidmont, Descartes seems to have been just another one of those damned atomists; nothing in his reply to Descartes suggests that he considered him any more significant than that.

Although Morin was against the new philosophy as well, he placed Descartes in a different pigeon-hole. For Morin, Descartes was, like himself, an open-minded traditionalist, one who respects both intellectual tradition and the new discoveries of the new age. For Morin, Descartes was hardly the philosophical radical, the revolutionary who wants to overturn the present world-view, and substitute another altogether different one. How much of this is a true perception of Descartes' views, and how much has to do with what Descartes left out of the *Discours*, how Descartes represented (and, perhaps, misrepresented) himself, I cannot say. But it is striking how Morin saw in Descartes one of his own kind.

In later years Descartes will be seen differently, an innovator who founded a school of thought, an original philosopher who saw what no one else had seen, the father of modern philosophy, and the philosopher who closed the book of the schools. Much more work needs to be done on 17th Century scholasticism and the reception of Descartes before we can speak with any real confidence on these matters. But to these first readers, at least, to Froidmont and to Morin, there does not seem to have been a Cartesian revolution in 1637.[42]

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NOTES

1. References to texts by Descartes and letters to Descartes are given from Adam and Tannery, eds., *Oeuvres de Descartes*, nouvelle présentation (Paris: J. Vrin, 1964–1974); abbreviated 'AT'. Citations are given in the text, for the most part, with volume number in Roman and page number in Arabic numerals. All the translations are my own.

2. In March 1638 Descartes reports to Huygens that copies had been sent to "la Flèche, . . . Louvain, & . . . l'Isle." [AT II 50]. In addition, as we shall later discuss, a copy went to J.-B. Morin at Paris.

3. The project is mentioned in AT II 49–50, 85, 221. See also Cornélis de Waard, ed., *Correspondance du P. Marin Mersenne* (Paris: P.U.F., 1932–), t. VII, 27–28, 195. (Henceforth abbreviated 'CM').

4. This passage, in Clerselier's edition of the correspondence, is not found in the autograph, strangely enough. Cf. AT II 660.

5. As Ch. Adam put it, "à La Flèche on se réservait." (Ch. Adam, *Vie et Oeuvres de Descartes* [Paris: Leopold Cerf, 1910], p. 238.) For Adam's account of Descartes' attempt to elicit the judgment of his teachers, see Adam, *Vie*, pp. 237–38. Eventually, he did get quite a favorable response from one of his teachers, Georges Fournier, who included a number complimentary remarks on Descartes in his *Hydrographie* (1643); see Adam, *Vie*, pp. 202–03, 206 n.a, 238, and Geneviève Rodis-Lewis, "L'accueil fait aux *Météores*" in the forthcoming proceedings of the CNRS Descartes Conference of June 1987.

6. See Lucien Ceyssens, O.F.M., "Le Janséniste Libert Froidmont," in Ceyssens, *Jansenistica Minora* t. VIII (Malines: Editions Saint-François, 1964), pp. 1–6.

7. Ibid., pp. 14–16.

8. Ibid., pp. 19f.

9. For a discussion of some of the themes in the *Meteorologicorum* . . . , see Georges Monchamp, *Galilée et la Belgique* (Saint-Troud: G. Moreau-Schouberechts, 1892), pp. 73–78. J.-R. Armogathe has recently suggested that this work of Froidmont's may have influenced Descartes' *Météores*; see his essay, "L'arc-en-ciel dans les *Météores*" in N. Grimaldi and J.-L. Marion eds., *La Discours et sa méthode* (Paris: P.U.F., 1987).

10. Froidmont seems to have been a Copernican in his early years, but by 1618 or so, he seems to have adopted a Tychonic view. For an account of his early astronomical views, see Monchamp, *Galilée*, pp. 36–52.

11. *Liberti Fromondi Ant-Aristrchus sive Orbis-terrae immobilis. Liber unicus* . . . (Antwerp: 1631); *Liberti Fromondi . . . Vesta, sive Ant-Aristarchi vindex, adversus lac. Lansbergium Philippi f. medicum middelbergensem* . . . (Antwerp: 1634).

12. For a survey of the arguments, see Monchamp, *Galilée*, pp. 79ff, 101ff.

13. Quoted in Monchamp, *Galilée*, p. 95.

14. See, for example, Leibniz, *Nouveaux Essais* . . . 2.23.31; *Essais de Théodicée*, Discours préliminaire §24, etc.

15. On the revival of atomism, see, e.g., Kurd Lasswitz, *Geschichte der Atomistik vom Mittelalter bis Newton* (Hamburg and Leipzig: Leopold Voss, 1890), 1, bk. II; Marie Boas, "The Establishment of the Mechanical Philosophy," *Osiris* 10 (1952), 412–541; Robert Kargon, *Atomism in England from Hariot to Newton* (Oxford: Oxford University Press, 1966). The history of the revival of Epicurus and Epicureanism, as well as the life and projects of Pierre Gassendi are treated in Howard Jones, *Pierre Gassendi, 1592–1655: An Intellectual Biography* (Nieuwkoop: Graaf, 1981).

16. It is difficult to identify this group, but it is possible that it revolved around one Henri Vande-Pitte, or Erycius Puteanus. See Georges Monchamp, *Histoire du Cartésianisme en Belgique* (Brussels: Hayez, 1886), pp. 18–19. Puteanus seems to have been on friendly terms with Pierre Gassendi, the scholar and advocate of Epicurus, and exchanged a number of letters with him. See P. Gassendi, *Opera Omnia* (Lyon, 1658) t. VI pp. 11–12, 16, 26–28, 39–40, 393–94. For a more complete account of Puteanus, see Th. Simar, *Étude sur Erycius Puteanus (1574–1646)* (Louvain: Bureau du Recueil, 1909). Simar recognizes Puteanus' interest in Epicurus, but sees him mainly interested in Epicurus as a moral philosopher (pp. 41–42). Furthermore, Simar argues that Puteanus was not a partisan of any one school, but an eclectic (p. 45).

17. *Liberti Fromondi . . . Labyrinthus sive de Compositione Continui Liber Unus* . . . , Ad Lectorum**.

18. Monchamp, *Cartésianisme*, p. 19.

19. For references to copies of the exchange in circulation, see, e.g., AT I 508, 515, 651–52; CM VII 185–86. A reference to circulated ms. copies of the exchange is found as late as 1645 in connection with Schoock and the disputes that arose out of the celebrated *Admiranda Methodus novae Philosophiae* . . . at Groningen. See AT IV 180.

20. Froidmont also complained that we experience pain not in the head, but in the limb affected by the "qualitas dolorifica" [AT I 406], that the perception of color cannot be explained by collision, but requires a "species intentionalis" [AT I 405–06], that sensations of heat and cold cannot be explained through differences of speed of corpuscles [AT I 407], and that the taste of salt is not due to the shape of salt corpuscles [AT I 408].

21. The tone did not seem to represent genuine personal hostility on Froidmont's part. Baillet reports that Froidmont and Descartes had "a close friendship, which they took care to maintain through mutual commendations, until the death of M. Descartes." See A. Baillet, *La Vie de Monsieur Descartes* (Paris, 1691), t. I p. 311. On the tone of the exchange, see Descartes' remarks to Plemp and to Huygens, AT I 475; AT II 48–49.

22. Froidmont was not the only reader to associate Descartes with the ancient atomists. See AT II 51, 396; III 166; IV 223.

23. See W. K. C. Guthrie, *A History of Greek Philosophy* (Cambridge: Cambridge University Press, 1962 et seq.) I, 173; II 386–87.

24. See Lynn Thorndike, *A History of Magic and Experimental Science* (New York: Macmillan, 1923–1958) VII, ch. 16.

25. See Pierre Costabel's account of this project in C. C. Gillespie, ed., *Dictionary of Scientific Biography* (New York: Scribner, 1974), IX 527–28.

26. *Famosi et antiqui problematis de Telluris motu, vel quiete hactenus optata solutio* (Paris, 1631); *Responsio pro Telluris quiete ad Jacobi Lansbergii . . . Apologiam pro Telluris motu* (Paris, 1634). On the recommendation not to publish, see CM III 173.

27. See CM III 368.

28. For a contemporary account of the incident, see *Le Mercure françois* 10 (1625) 503–12, which contains a summary of Morin's pamphlet. See also Lasswitz, *Geschichte* I 482–87; Adam, *Vie*, 85–88; CM I 167–68.

29. Morin, *Refutation*, letter of dedication, p. 3. (The letter of dedication is paged separately.)

30. Morin, *Refutation*, p. 4.

31. The theses are directed not only against Aristotle, but also "contre les dogmes . . . de Paracelse & des Cabalistes." (Morin, *Refutation*, p. 11).

32. Morin, *Refutation*, pp. 11–12.

33. Ibid., p. 17.

34. Ibid., p. 36; cf pp. 32–49.

35. Ibid., pp. 103–04.

36. See René Pintard, *Le Libertinage érudit dans la première moitié du XVII^{e} siècle* (Paris: Boivin, 1947), pp. 385–87, 409–12.

37. The letters are as follows: Morin to Descartes, 22 February 1638 (AT I 537f); Descartes to Morin, 13 July 1638 (AT II 196f); Morin to Descartes, 12 August 1638 (AT II 288f); Descartes to Morin, 12 September 1638 (AT II 362f); Morin to Descartes, October 1638 (AT II 408f). In his letter to Mersenne of 15 November 1638, Descartes tells Mersenne that he doesn't intend to continue the exchange (AT II 437).

38. For other readers who were similarly dissatisfied, see CM VII 27, 212; VIII 221. Though his letter to Descartes is now lost, we can infer from Descartes' reply (AT I 562–65) that P. Vatier had similar questions.

39. This passage of the *Dioptrique* is quoted by Morin in his first letter, AT I 542. Descartes offers an important clarification in his letter of 12 September 1638, AT II 364.

40. For the development of Morin's argument, see AT I 548, 550, AT II 296, 411, 437.

41. I suspect that Froidmont considered himself in this camp as well. In the 1646 edition of his *Meteorologicorum . . .*, Froidmont complains of those who follow Aristotle too closely, and are unwilling to admit him wrong; see Monchamp, *Galilée*, pp. 145–46. Monchamp considers this a change in Froidmont's view, due perhaps to the condemnation of Jansenius' *Augustinus* by Pope Urban VIII, the same pope who condemned Galileo's copernicanism. But no such explanation is needed. The fact that he accepted Tycho over Ptolemy shows that he is willing to bend to new observations and arguments, and reject portions of traditional doctrine. On the relation between the Tychonic system and progressive Aristotelianism, see ch. 1 of Edward

Grant, *In Defense of the Earth's Centrality and Immobility: Scholastic Reaction to Copernicanism in the Seventeenth Century, Transactions of the American Philosophical Society*, vol. 74, part 4, 1984. For a general account of the complexities of 16th and 17th-Century Aristotelianisms and their relations with the new philosophies, see Charles B. Schmitt, *Aristotle and the Renaissance* (Cambridge, MA: Harvard University Press, 1983). Both Grant and Schmitt emphasize the importance of seeing late scholasticism as a living, breathing tradition, reacting to other movements of thought and trying to come to terms with them. There is an enormous amount of work left to do to flesh out the suggestive picture that Grant and Schmitt have given us; this essay is a small contribution to that effort.

42. I would like to thank Roger Ariew and Peter Dear for helpful comments on earlier drafts of this essay, and John Carriero for his help in obtaining a photocopy of Morin's *Refutation*. Earlier versions were presented at the June 1987 CNRS colloquium on Descartes in Paris and at the October 1987 meetings of the History of Science Society in Raleigh, North Carolina. A French version of this paper is published in the proceedings of the CNRS colloquium.

Part II

Metaphysics and Cartesian Metaphysics

Graduate Faculty Philosophy Journal
Volume 11, Number 1

On Descartes' Constitution of Metaphysics

Jean-Luc Marion

1. AMONG the numerous difficulties raised by the novelty of Cartesian thought, one of the greatest and yet one of the most secret, is whether Descartes at all deserves the name 'metaphysician', or whether he even intended to be called one. It must, indeed, be granted that some of his followers (for instance, Malebranche) and many modern scholars (consider Ferdinand Alquié, Henri Gouhier, and Leslie Beck) willingly used the word 'metaphysics' in the title of some of their works, e.g., *Entretiens sur la métaphysique, The Metaphysics of Descartes*. However, they formulated no Cartesian theory of metaphysics; nothing in their books can be identified as such a theory, at least if we take our bearings by the precise meaning given to 'metaphysics' by Thomas Aquinas, Duns Scotus, Suarez, Leibniz or Kant. When we speak of a Cartesian metaphysics, we in fact mean an epistemology, a theory of consciousness, some proofs of the existence of God, or a foundation of physics, and so forth. But in Descartes' writings we fall short of finding even the outline of a genuine metaphysics, as it was defined, for instance, by Suarez:

> and to it as one and the same he [Aristotle] attributes the names and attributes which in part suit it according as he deals with God and the immaterial spirits; as such it is called theology, or divine science, as well as first philosophy; in part, when he deals with being as being, both with its attributes and principles, by which reason the science is called universal and metaphysical.

This paper was delivered at Columbia University on the 1st of October, 1985. We would like to thank the author for granting us permission to publish it.

To sum this up roughly, Suarez divided metaphysics into two sciences strongly linked to each other. Firstly, we have a science devoted to the analysis of being as being, *ens in quantum ens*; secondly, a science considering God and immaterial spirits. Although Suarez called the former alone '*metaphysica*', he definitively established the classical definition of metaphysics, which runs through the German *Schulmetaphysik* up to Kant and Hegel. In that sense, metaphysics could be divided firstly into an ontology, which considers being as being (being in general) and is also called '*metaphysica generalis*', and secondly into a *metaphysica specialis*, which focuses on the three most noble entities, God, soul, and world. We need no deep examination to discover that Descartes did not follow that path. We shall restrict ourselves to giving one piece of evidence of Descartes' farewell to metaphysics. When explaining to his friend, Father Mersenne, what title would best fit his main work, the *Meditations*, he was emphatic: "I believe that it can be titled . . . *Meditationes de Prima Philosophia*; for, in it, I treat not only of God and the soul, but in general of all first things that can be known by philosophizing in accordance with order (*par ordre*)."[2] Such a statement offers at least three grounds for perplexity. (i) The genuine title of the *Meditations* refers to the so-called *prima philosophia*, and leaves out any reference to *metaphysica*; the commonly received title, *Méditations métaphysiques*, was contrived by the duke of Luynes, but was crossed out by Descartes. (ii) However, it looks as if Descartes undertakes here to build one of the two sciences linked together in traditional metaphysics, namely the *prima philosophia*, which bears upon God, the soul, and the world. Such an interpretation would be deceptive, for Descartes rejects here the very objects to which the traditional *prima philosophia* is devoted. He has good reasons for doing so; he indeed discovered some other objects to fill God's and the soul's places, and these are " . . . all first things that can be known by anyone philosophizing in accordance with order." What order? Answer: the Cartesian order carried out and exhibited in the *Regulae ad directionem ingenii*. As such, in his *Meditationes*, Descartes endeavors to offer neither a *metaphysics* in the wide sense, nor a *prima philosophia* in the narrow sense. (iii) Concerning the so-called *ontologia*, we need no analysis to point out that it vanishes altogether. The title remains perfectly silent about it. So far, then, we may wonder whether Descartes can really be called a metaphysician, it being assumed that in the history of philosophy metaphysics was defined in a precise manner.

To answer this question, we shall proceed step by step and discuss the following issues: (i) why and to what extent did Descartes reject any theory of being as such? (ii) does that rejection offer sufficient grounds to charge him with ignoring metaphysics altogether? (iii) did Descartes build something akin to metaphysics, in a sense that is deeper than any scholastic definition? (iv) if so, did the philosophy of Descartes remain perfectly consistent, or did it not?

2. The refusal of any science concerning being as such was embraced by Descartes very early on. Starting with the unfinished and unpublished *Regulae*, he decided that, at least from the point of view of the new method, each thing ought to be considered apart from its essence or its own being, and referred to the order of human knowledge, i.e., taken into view insofar as it is connected with previously well known other things. In other words: "... all things can be set into certain series, not of course insofar as they are referred to some genus of being, in the way in which the Philosophers have divided them into their categories, but insofar as the ones can be known by means of the others."[3] Things are not to be classified in accordance with the categories of being in Aristotelian fashion, namely by using the main category of *ousia, substantia*, in order to yield an ontology — regardless of whether the classification explicitly bears the label 'ontology' or not. Things are to be considered — and *this* constitutes the first achievement of the so-called Copernican revolution — in accordance with the order of their clarity. The first member of a series is seldom a substance, but rather an accident or whatever may procure the most clear and distinct knowledge. This new order, resting as it does on the epistemological privilege of clarity, could not have been established without at least equal privilege being granted to the human mind. This is what Descartes did: "... singular things must be considered in relation to our cognition, in a way other than if we were to speak about them as though they truly existed."[4] Or: "... treating of things only insofar as they are perceived by the intellect. . . ."[5] One must emphasize that Descartes goes here far beyond the ingenuous dichotomy between the order of things and the order of reasons. From now on, things themselves appear as known within the order of reasons; they are to be reduced to an amount of reasons, or, more precisely, to the *data* registered about them by *ordo et mensura*, i.e., by the order and measure in accordance with which the *Mathesis universalis* operates. The problem of entity as being appears quite meaningless to Descartes, since in order to know a thing we must first know it as known, therefore as an object referred to our mind. If we encounter an allegedly new entity ("*novum aliquod genus entis*"[6]), it can either be known clearly and distinctly, and as such, it must give up the idle name '*ens*' so as to be called 'object'; or else it remains defini-

tively unknown and must be eliminated. Each *ens* first proves to be known as an object, and if it is not, it cannot be said to be. Now, if we look back to the four meanings of being distinguished by Aristotle, we easily discover that Descartes rejected three of them. (i) Being as the set of categories is disqualified when Descartes criticizes the divisions of things "into their categories [made] by the Philosophers."[7] (ii) Being as divided into potential and actual being vanishes since "properly speaking, potential being is nothing. . . ."[8] (iii) Being as substance facing accident can no longer stand, since according to the *Principles of Philosophy*, substance cannot be known except through an attribute: ". . . that alone does not affect us by itself; but we easily know it through its attribute. . . ."[9] The only sense of being that remains seems to be restricted to being as the true and the false, which Descartes obviously admitted into his thought: "properly speaking truth or falsity can only be in the intellect alone. . . ."[10] Either being disappears, or it is ruled by method, knowledge and mind. On such ground, it would be both difficult and futile to undertake an ontology, since 'being' means either being known or exactly nothing. Descartes saw the consequence. Being, being nothing but knowledge, ontology and metaphysics can no longer claim to be the goal of philosophical labor: ". . . *in Metaphysica nihil intelligitur per ens*."[11] This sentence could be translated in accordance with its obvious meaning: "in the field of metaphysics, nothingness cannot be understood if not through being." But we may nevertheless also translate it in a more farfetched, yet quite lucid, manner: "by the word 'being', there is nothing else but nothingness to be learnt," and such is the failure of metaphysics. We are now in a position to answer our first question. Beyond Descartes' symptomatic refusal of the title *Meditationes metaphysicae*, his rejection of metaphysics depends upon a fierce destruction of the Aristotelian priority of being as being. Descartes avoided metaphysics because he undid the very possibility of ontology — except for a grey one.[12]

3. But are we bound to a narrow scholastic concept of metaphysics? If so, we have without a doubt reached a dead-end. It may be, however, that metaphysics could be thought of as a deeper and more meaningful issue. A more operative definition of metaphysics may be available to us today. I would like to suggest that we might pay great attention to Heidegger's statement that "Metaphysics, carefully and clearly thought, is onto-theo-logy."[13] Roughly speaking, 'onto-theo-logy' means the twofold unity of being as the universal foundation of all entities, and the most perfect entity, which is understood as a first cause producing less perfect entities and thereby grounding being itself. Ac-

cording to this view, we are allowed to call 'metaphysics' any doctrine which unifies within the same framework a statement concerning being as such — i.e., being as that which is beyond all entities — and a proof of the existence of a first and most excellent entity, ruling all other entities as well as being itself. But are we allowed to apply this onto-theo-logical constitution of metaphysics to Descartes? Is it not preposterous to try to confirm the applicability of a rather intricate concept of metaphysics to a doctrine which failed to exhibit the plain concept of metaphysics in the first place? No, it is not: we may inquire into a Cartesian onto-theo-logy because of two good reasons, which in fact compel us to do so. (i) Heidegger stresses that one of the main achievements of onto-theo-logy lies in the interpretation of God as a mere *causa sui*, i.e., as a cause of himself. Now, this feature of onto-theo-logy as such squares perfectly well with Descartes, who, the first among all philosophers, dared to call God by this self-contradictory name. Until Descartes, *causa sui* was held to be an absurdity — something quite unthinkable. In this respect, Spinoza remains but a pale follower of the positive interpretation initiated by Descartes. If onto-theo-logy amounts to the idea of *causa sui*, and if this idea of *causa sui* belongs to Descartes' thought, one would have to infer that onto-theo-logy could not fail to include Descartes. (ii) According to Heidegger, any onto-theo-logy implies two different principles or causes operating together: being, as universal principle, grounds every entity; and, in reverse order, the most perfect entity, as a first cause, produces all other entities and proves to be a ground for being itself. With respect to this, we should emphasize that Descartes distinguishes, in a most striking way, two kinds of principles:

> I will only add that the word 'principle' can be taken in several senses. It is one thing to look for a common notion so clear and so general that it can serve as a principle to prove the existence of all the entities (*entia*) to be discovered later; and another to look for *an entity* whose existence is known to us better than that of any other, so that it can serve as a principle to discover them.[14]

In the first sense, 'principle' means a universal, a hypothetical and well-known axiom, which of course does not exist as an entity, although it grounds every entity. As an example of the first sense, Descartes mentions the principle of identity. In the second sense, 'principle' designates an existing entity: for instance, ". . . that our Soul exists."[15] This quote argues in favor of the hypothesis of a Cartesian onto-theo-logy in two ways. First, the alleged ambiguity of 'principle' in Descartes squares exactly with the ambiguity of the concept of ground (*Grund, begründen*) in Heidegger. Secondly, the right of our soul to be called a first principle without regard to God's claim to primacy, would seem highly questionable if no onto-theo-logical constitution could back it.

4. To what extent does Cartesian thought belong to metaphysics? Answer: insofar as it succeeds in building up an onto-theo-logy. Our first approach failed because we discovered only one apparently impoverished meaning of being in Descartes: being as truth or falsity within the mind. It seems too imperfect to yield an ontology and to render possible a metaphysics. However, Descartes decided otherwise: considering the mere object, that is to say the thing as viewed, the *res repraesentata*,[16] he recognized this representation itself as a real modality of being:

> however imperfect the mode of being may be, by which a thing is objectively in the intellect through its idea, nevertheless it is assuredly not entirely nothing, nor consequently can it proceed from nothing.[17]

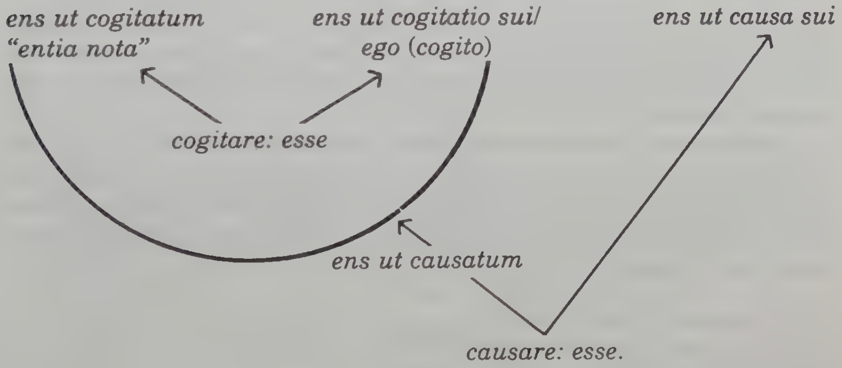
To be thought and represented means more than nothing and no less than being; *'esse objective'* means at least to be in the way in which objects are. As everything pertaining to *Mathesis Universalis* can be an object to the extent that there appears something like "the total universal object of Mathesis,"[18] this universal representative characteristic amounts to more than a mere epistemology: it is rather a true ontology. I would like to suggest that when Descartes says that the *ego* subjects to its gaze everything whatsoever as an object—". . .I indeed always apprehend a thing as subjected to my thought"[19]—, he in fact utters his first metaphysical statement: every entity, insofar as it is thought, is. *Esse est cogitari*: to be is to be as a *cogitatum*. With this, Descartes completes the principle of an ontology of objectity, which is not to be confused with objectivity. For him, 'to be' means to be thought as an object for *cogitatio*. That result being granted, another question remains open: in such a context, what entity could play the part of the most excellent one and exhibit its excellence in accordance with the universal feature of being as being thought? We are not at a loss to give the right and convenient answer: every *cogitatio*, whatever its *objectum* may be, always refers to a *cogitans*. *Cogitatio* does not merely reflect the light of things, as a mirror does. Moreover, *cogitatio* focuses, like a curved lense, the rays of light on a burning point, which Descartes calls '*ego*', Hence the *ego* appears as more than a condition of knowledge, namely as the entity which rules the reality of the objects and proves to be itself the paramount entity. Evidence for that point comes from two famous topics. (i) The hyperbolic doubt makes clear that the *ego* not only survives the epistemological shipwreck of every *cogitatum*, but also reinforces its primacy through thinking — even in the absence of any external thing to be thought. (ii) The vanishing piece of wax demonstrates that, even when an object appears and remains indubitable, the knowledge obtained about it refers directly to our own mind, and by no means to sensible properties of that object: "the perception of the wax is neither a seeing, nor a touching, nor an imagining... but only an inspection of the mind. . . .[20] Following Heidegger, we may describe the *ego* as *cogito me cogitare rem*: I think myself thinking a thing. In fact, Descartes' assertions come very close to using this formula: "when I see, or... when I think that I see..."[21] and "I conceive that I am a thinking thing. . . ."[22] What, then, should we conclude? Obviously that Descartes has achieved at least a sketch of an onto-theo-logy: to be is to be thought as *ens cogitatum*, the ground of which is the *ego* as *cogito me cogitare rem*. This is the first sentence of Descartes concerning the being of entities.

Why the first? It indeed seems possible to find another Cartesian sentence concerning the being of entities. It is a fact that the highly praised order of reasons suffers an interruption during the course of the *Meditations*: in its middle, *Meditatio* III stops relying on the principle of *cogitatio* and admits of another principle, that of causality: "Now it is manifest by the natural light that there must be at least as much in the efficient and total cause as there is in its effect."[23] By means of this principle, it becomes at last possible to escape the jail of solipsism erected by the exclusive use of the *cogitatio*; the *ego* discovers that only God himself can really cause the idea of the infinite it discovers in itself. This famous and controversial issue rests completely on the principle that nothing, that is, no thing, or entity, at all — could be, i.e., exist, if it were deprived of an efficient cause, sufficient to produce it. Now, already in the *Regulae* cause was torn away from effect in order to be set up as an *absolutum*, which, in lieu of substance, has the ability to initiate the series of things to be discovered.[24] And in one of his letters of 1630 to Father Mersenne, Descartes argued that with regard to the truth God acts as a "*totalis et efficiens causa*" (total and efficient cause).[25] In 1641, however, the *Meditationes* stressed with greater insistence that the universal validity of causality can produce existence: "But surely the natural light dictates that no thing exists, of which one may not ask why it exists, or whose efficient cause one may not seek, or, if it has no efficient cause, of which one may not ask why it is in need of none. . . ."[26] The natural light, Descartes says, utters here no less than a *Diktat* (*dictat*), or, more exactly, a dictate dictated by something like a dictator, who claims to rule all of existence. More plainly, we should say that Descartes states here his second sentence on the being of entities: to be is to be the effect of a prior sufficient and efficient cause. In this context, then, '*ens*' means *causatum* (caused). Granting the conclusion, is it not also possible to answer the question concerning the most excellent entity in terms of *ens* as *causatum*? Indeed, it is. As was pointed out earlier, Descartes carried out a major innovation when he established the formula '*causa sui*'. He paid no attention to the discussion treating the question whether in this case causality was efficient, formal or both. In any case, the odd concept of *causa sui* is obviously self-contradictory, because the same entity cannot at the same time be a cause and an effect. *A fortiori*, it cannot be its own cause or its own effect. Descartes was of course aware of these logical flaws. Why, then, did he nevertheless opt for *causa sui*? If it was not because of bold stubbornness, we must recognize that in this topic Descartes saw a metaphysical challenge which was more important than every logical rule, for the fate of logic itself seemed to rest upon that challenge. The second onto-theo-logical constitution of Cartesian metaphysics requires an entity capable of achieving the status of a *causa sui*, i.e., God, in the same way as the first onto-theo-logical constitution of Cartesian metaphysics demanded an entity that would embody the *cogitatio sui*, i.e., the human mind.

We thus reach a very strange, but quite consistent conclusion. Descartes' main difficulty does not reside in his alleged failure to build a genuine metaphysics, but in the fact that he has achieved two onto-theo-logical constitutions of metaphysics, both rational and possibly self-sufficient.

5. The view that Descartes lacks a metaphysics thus proves to be merely the consequence of a narrow definition of ontology. With the help of the more comprehensive perspective offered by the notion of onto-theo-logy, we may obtain a positive restatement of the issue of Cartesian metaphysics. However, we readily admit that this about-face remains questionable, at least because of the danger of an obvious inconsistency, according to which Cartesian metaphysics — if there is one — would appear self-contradictory. To face this challenge we shall put the hypothesis of such a double onto-theo-logy to several tests. (i) Are the two onto-theo-logies opposed and inconsistent, or are they merely different and do they form a double onto-theo-logy that is really

unified? I should like to suggest that the latter side of the alternative fits Descartes' position better, and that both onto-theo-logies can be linked together in one set. For the whole onto-theo-logy of *ens ut cogitatum*, i.e., entity being insofar as it is thought, is grounded in the *ego* as a first principle — and Descartes names it in many texts as such. But this *ego* can rule the being of other entities only within the sphere of *cogitatio*; beyond the borders of *cogitatio* the *ego* can no more claim to work as the first principle and ought to submit to another first principle, whose primacy depends on causality, namely on God, the *totalis et efficiens causa.*[27] If that is the case, the *ego* is not any less created and caused than each *cogitatum* or each idea. Since causality reaches even ideas (*"etiam de ideis"*[28]), the *ego*, which embodies the essence of *cogitatio* according to the sentence '*cogito me cogitare rem*' (I think myself thinking a thing), becomes an effect of God: "God is the cause of me, as for me I am an effect"[29] and "... I myself, as well as every other thing... have been created."[30] Up to that point the idea of cause unfolds a new onto-theo-logy, but it also binds the first one to it: the whole realm of *ens ut cogitatum* (entity as thought) is, so to speak, translated without a gap into the new language of causality. Although the first onto-theo-logy loses its sufficiency, it is by no means deprived of self-consistency. *Ens ut cogitatum* is still true and valid, but only under a condition — the condition of being caused by creation. We would like to encapsulate this in the following figure:[31]



(ii) Furthermore, the hypothesis of a double onto-theo-logy may help us throw some light on difficult classical issues concerning Descartes' procedure in the *Meditationes*. Many impressive scholars have emphasized that the order of reasons suffers an interruption in the middle of *Meditatio* III. On the same page Descartes brings new resources into play, namely the previously unused concept of substance and the idea of efficient cause as principle.[32] It is well known that Descartes often unreluctantly hails the *ego* as a "*premier principe*" while also invoking God's incomprehensible power. I want to argue that these two difficulties square perfectly with my hypothesis: what might have appeared to former scholars as no less than inconsistency only results from the fact that Descartes builds not one, but two onto-theo-logies. Indeed, the question remains open whether this duplication amounts to an inconsistency or whether it resolves textual and logical problems in the *Meditationes*. Perhaps both are equally true. At any rate, we ought not to overlook the fact that our hypothesis is far from dissolving the unity and consistency of Cartesian metaphysics but rather reinforces them.

(iii) I conclude by sketching a long-range historical consequence of this hypothesis. If Descartes achieves a genuine metaphysical position anew by setting up a double onto-theo-logy, it might be supposed that each attempt to erect a post-Cartesian metaphysics (a category including anti-Cartesian as well as pro-Cartesian metaphysics) borrows some material from either of the two major traits of Cartesian metaphysics. For instance, Berkeley without a doubt relies on the first Cartesian onto-theo-logy, which is clearly expressed by the formula '*esse est percipi aut percipere*', which means *esse est esse cogitatum aut cogitare.*[33] The same can be said of Locke. No doubt that Leibniz's *principium reddendae ratione*, according to which every entity needs a *causa sive ratio* in order to be, relies on the second Cartesian onto-theo-logy.[34] Other thinkers, such as Spinoza, Malebranche and Hume, raise a more balanced debate. Within this perspective, scholars may discover new fields of research.

In conclusion, I wish to emphasize not only that the reality of a Cartesian metaphysics can be demonstrated, even if it lacks an explicit ontology, but also that the use of the hypothesis launched by Heidegger that 'metaphysics' designates onto-theo-logy will prove very fruitful for the history of philosophy.

NOTES

1. Francisco Suarez, *Disputationes Metaphysicae* (Hildesheim: Georg Olms Verlag, 1965), vol. 1, *Disputatio prima*, sect. 3, n. 9, p. 24: "...eique tanquam uni et eidem attribuit nomina et attributa, quae partim illi conveniunt, secundum quod versatur circa Deum et intelligentias; et sic vocatur theologia, seu scientia divina, et prima philosophia; partim, ut versatur circa ens in quantum ens, et prima attributa, et

principia ejus, qua ratione dicitur scientia universalis et metaphysica."

2. René Descartes, *Oeuvres Complètes*, eds. C. Adam and P. Tannery (Paris: Librairie J. Vrin, 1974), vol. III, p. 239, 2-7 (to Mersenne, Nov. 11, 1640): "Je crois qu'on le pourra bien nommer... *Meditationes de prima Philosophia*; car je n'y traite pas seulement de Dieu et de l'âme, mais en général de toutes les premières choses qu'on peut connaître en philosophant par ordre." Hereinafter the complete works will be referred to as *AT*, followed by volume, page and line numbers.
3. *AT*, X, 381, 9-13 (*Rules for the Direction of the Mind*) "...res omnes per quasdam series posse disponi, non quidem in quantum ad aliquod genus entis referuntur, sicut illas Philosophi in categorias suas diviserunt, sed inquantum unae ex alliis cognosci possunt."
4. *Ibid.*, X, 418, 1-3 (*Rules*): "...aliter spectandas esse res singulas in ordine ad cognitionem nostram, quam si de iisdem loquamur prout revera existunt."
5. *Ibid.*, X, 418, 12-13: "...de rebus non agentes nisi quantum ab intellectu percipiuntur...."
6. *Ibid.*, X, 427, 9-10 (*Rules*).
7. Cf. note 3.
8. *AT*, VII, 47, 21-22 (*Meditations on First Philosophy*): "...esse potential[e] ... proprie loquendo nihil est...."
9. *Ibid.*, VIII-1, 25, 5-6 (*Principles of Philosophy*, I, 52): "...hoc solum per se nos non afficit; sed facile ipsam agnoscimus ex quolibet ejus attributo...."
10. *Ibid.*, X, 396, 3-4 (*Rules*): "...veritatem proprie vel falsitatem non nisi in solo intellectu esse posse...."
11. *Ibid.*, V, 153, 35 (*Conversation with Burman*).
12. Editor's note. Marion refers here to the thesis developed in his book *Sur l'ontologie grise de Descartes, Science cartésienne et savoir aristotélicien dans les Regulae* (Paris: Librairie Philosophique J. Vrin, 1975; 1981, 2nd ed.), whose title translates as *On Descartes' Grey Ontology, Cartesian Science and Aristotelian Knowledge in the Regulae.* The book aims at showing that in this early work Descartes engages in a dialogue with an unnamed interlocutor, who turns out to be Aristotle. It describes how the construction of Cartesian epistemology is carried out via the rejection of Aristotelian ontology. The *Rules* implicitly substitute a metaphysically unelaborated ontology of the object for Aristotle's ontology of *ousia.* The initial Cartesian ontology of the object thinks the Being of beings (or entities) as *ego*, and not as *ousia* as Aristotle does. From Aristotle to Descartes, the beings (or entities) cease being things, i.e., *pragmata* founded in *ousia*, to become objects. More precisely, the *ousiai* become eclipsed by the objects — what Marion also calls the *epoché* of the nature of things. Descartes dispenses with the Aristotelian project of revealing (more accurately, of letting become manifest) the nature of things: instead he aims at knowing them efficaciously by means of "suppositions" and "comparisons," i.e., by the construction of models ruled by the sole demand for intelligibility.

    The Cartesian ontology is said to be grey, for it conceals itself under an epistemological discourse, and "maintains the thing in the greyness of the object, and thus bears testimony to the intoxication (to the *hybris*?) of the *ego*, 'master and owner' of the world reduced to evidence." (*Sur l'ontologie*... 2nd ed., p. 189) The words 'greyness' and 'intoxication' respectively render the terms '*grisaille*' and '*griserie*'. Because the Cartesian ontology of the *Rules* is a half-tone substitute for ousiology, which stands alongside ousiology and as such does not deny that the *pragmata* really exist, Marion can say of the objects constituted by it that they are "grey shadows of things" and that the scientific world exhibits a "crepuscular character." (*Ibid.*, p. 190)

13. Martin Heidegger, *Identität und Differenz* (Pfullingen: Günther Neske Verlag, 1957), p. 50: "Die Metaphysik ist sachgemässer und deutlicher gedacht: Onto-theo-logik."
14. *AT*, IV, 444, 4-12 (to Clerselier, June or July, 1646): "...le mot de *principe* se peut prendre en divers sens, et que c'est autre chose de chercher *une notion commune* qui soit si claire et si générale qu'elle puisse servir de principe pour prouver l'existence de tous les Etres, les *Entia* qu'on connaîtra par après; et une autre de chercher *un Etre* l'existence duquel nous soit plus connue que celle d'aucuns autres, en sorte qu'elle nous puisse servir de principe pour les connaître."
15. *Ibid.*, IV, 444, 23-24 (*ibid.*): "*...que notre Ame existe....*"
16. *Ibid.*, VII, 8, 23 (*Meditations*, Preface).
17. *Ibid.*, VII, 41, 26-29 (*Meditations*, III): "...quantumvis imperfectus sit iste essendi modus, quo res est objective in intellectu per ideam, non tamen profecto plane nihil est, nec proinde a nihilo esse potest." See also 103, 1-4.
18. *Ibid.*, V, 160, 17-19 (*Conversation with Burman*): "...totum universum Matheseos objectum...."
19. *Ibid.*, VII, 37, 8-9 (*Meditations*, III): "...semper quidem aliquam rem ut subjectum meae cogitationis apprehendo...."
20. *Ibid.*, VII, 31, 23-25 (*Meditations*, II): "...ejus [viz. cerae] perceptio non visio, non tactio, non imaginatio est ... sed solius mentis inspectio...."
21. *Ibid.*, VII, 33, 12-14 (*Meditations*, II): "...cum videam, sive... cum cogitem me videre...."
22. VII, 44, 24 (*Meditations*, III): "...concipiam me esse rem cogitantem...."
23. *Ibid.*, VII, 40, 21-23 (*Meditations*, III): "Jam vero lumine naturali manifestum est tantumdem ad minimum esse debere in causa efficiente et totali, quantum in ejusdem causae effectu."
24. *Ibid.*, X, 383, 1-10 (*Rules*).
25. *Ibid.*, I, 151, 1-152, 2 (to Mersenne, May 27, 1630).
26. *Ibid.*, VIII, 108, 18-22 (*Meditations*, Ist Responses): "Dictat autem profecto lumen naturae nullam rem existere, de qua non liceat petere cur existat, sive in ejus causam efficientem inquirere, aut, si non habet, cur illa non indigeat, postulare...."
27. *Ibid.*, VIII, 40, 22-23 (*Meditations*, III). See also *ibid.*, I, 152, 1-2 (to Mersenne, May 27, 1630).
28. *Ibid.*, VII, 41, 3 (*Meditations*, III).
29. *Ibid.*, V, 156, 8-9 (*Conversation with Burman*): "Jam autem Deus mei causa est, ego ejus effectus, ergo ei similis."
30. *AT*, VII, 45, 13-14 (*Meditations*, III): "tum ego ipse, tum aliud omne... est creatum."
31. Editor's note. Translation of the terms and phrases occuring in the diagram: *ens ut cogitatum*: entity as thought; *entia nota*: known entities; *ens ut cogitatio sui*: entity as thought of itself; *ego* (*cogito*): I (I think); *ens ut causa sui*: entity as cause of itself; *cogitare*: to think; *esse*: to be; *ens ut causatum*: entity as caused; *causare*: to cause.
32. For this point, see my discussion in *Sur la théologie blanche de Descartes* (Paris: Presses Universitaires de France, 1981), pp. 392-396 and in "Descartes et l'ontothéologie," *Bulletin de la société française de philosophie*, LXXVI, 1982, pp. 117-158.
33. Editor's note. Translation of the two sentences: *Esse est percipi aut percipere*: To be is

to be perceived or to perceive; *Esse est esse cogitatum aut cogitare*: To be is to be thought or to think.

34. Editor's note. Translation of expressions: *principium reddendae rationis*: principle of a reason having to be given; *causa sive ratio*: cause or reason.

[5]

PAUL RICOEUR

THE CRISIS OF THE *COGITO*

ABSTRACT. If Descartes's *Cogito* can be held as the opening of the era of modern subjectivity, it is to the extent that the "I" is taken for the first time in the position of *foundation*, i.e., as the *ultimate* condition for the possibility of all philosophical discourse. The question raised in this paper is whether the *crisis* of the *Cogito*, opened later by Hume, Nietzsche and Heidegger on different philosophical grounds, is not already contemporaneous to the very *positing* of the *Cogito*.

Taking as our guide the first three of Descartes's *Meditations*, I should like to stress two points: I want first to underscore the radical discontinuity introduced into philosophical investigation by the *cogito ergo sum*, set in the position of primary truth. Next, I want to show to what extent the *Cogito*, such as it was actually formulated by the historical Descartes, falls short of satisfying the unlimited ambition with which philosophical tradition has credited him. Descartes's *Meditations* – or, to give them their complete title, which is not without importance for our purposes, *Meditations on the First Philosophy in Which the Existence of God and the Real Distinction of Mind and Body are Demonstrated* – do present the strange character that, in order to *begin* to philosophize, the certainty of the self has to be put in the position of first truth, but that, in order to *continue* to philosophize, this same certainty must in a sense be toppled from its dominant position. The recognition of this *crisis* of the *Cogito*, contemporary to the *positing* of *Cogito*, constitutes the thrust of the present investigation.

1. POSITING THE *COGITO*

The first two *Meditations* attest to the immense ambition belonging to a philosophy which the *Cogito* inaugurates. The universal and radical nature of the project are apparent in the opening lines: "I was convinced of the necessity of undertaking once in my life to rid myself of all the opinions I had adopted, and of commencing anew the work of building from the foundation, if I desired to establish a firm and abiding superstructure in the sciences" (*Meditation I*). The universal character of the undertaking is of the same magnitude as the doubt, which does not exempt from the region of opinion common sense, the sciences – both mathematical and physical –

Synthese **106:** 57–66, 1996.
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or the philosophical tradition. However, the radicalness of the undertaking is just as important as its universality. This radicalness has to do with the nature of a doubt, itself incomparable to that one might exercise within the three aforementioned domains. The fact that all reality can be suspected of being no more than a dream, that the simple truths of geometry and arithmetic can be held to be uncertain, that the distinction between seeming and being vacillates – this threefold questioning is incomparable to the localised doubts that stand out against the backdrop of some sensible, scientific or metaphysical certainty, which itself is uncontested in the moment of doubt. The hypothesis of being completely fooled stems from a doubt that Descartes calls "metaphysical" in order to signal its disproportion in relation to all doubt kept within a space of certainty. In order to dramatize this doubt, Descartes forges the incredible hypothesis of a great deceiver or a malignant demon, the inverted image of a veracious God, reduced to the state of simple opinion: "How do I know", Descartes asks, "that I am not also deceived each time I add together two and three?. . . " (ibid.).

What happens to the self in this dramatic episode? There are, it seems to me, two important points to stress here. On the one hand, all subjectivity has not fallen with the collapse of opinion, although the human body has followed the fate of all bodies: if I can doubt the reality of sensible things, I can also doubt "that I am in this place, seated by the fire"; with this body-self all the reference points of deictic terms are abolished. And yet, all subjectivity cannot be swallowed up in the depths of doubt, since someone is performing the doubt. The doubt, indeed, is not merely suffered, it is directed: "I will at length apply myself earnestly and freely to the general overthrow of all my former opinions" (ibid.). Even the hypothesis of the malignant demon is a fiction that I invent: "I become my own deceiver, by supposing, for a time, that all those opinions are entirely false and imaginary. . . " (ibid.). The *I* is, in this way, raised to a power proportionate to the radical nature of the doubt it exercises. From this stems our second remark: the *I* that doubts, who is it? It is assuredly Descartes' *I*: in the *Discourse on Method*, the autobiographical features of the adventure are heavily stressed. Nor are these features erased in the *Meditations*, as is confirmed in the opening lines: "Several years have now elapsed since I first became aware that I had accepted, even from my youth, many false opinions for true. . . " (ibid.). But, as the doubt becomes ever more radical, the *I* gradually loses its "token" character. This is not, however, in order to resort to the "*I* as type", to the empty *I* found in the table of personal pronouns. The strangeness adhering to doubt results in the *I* stripping itself of its autobiographical character in order to become, not just anyone, in the sense of indicators and deictic terms, but an *I* as metaphysical or hyperbolical as doubt itself, an *I* that, by shedding its body along the way, loses its anchoring and, therefore, breaks with the conditions for ordinary self-designation as well as for identifying reference: "Let us suppose, then ... even that we really possess neither an entire body nor hands such as we see" (ibid.). To the extent, then, that it is just as metaphysical and hyperbolical as doubt, this *I* possesses immediately the value of an example, but in a sense of "anyone" which is without any common measure with its grammatical sense: anyone who, after Descartes, retraces the trajectory of doubt, says, as he did, *I*. But, in so doing, this *I* becomes a non-person, that is to say, unidentifiable, undesignatable, beyond the distinction between self-ascribable and other-ascribable predicates. This is why the *who* of doubt in no way lacks others, since, by losing its anchoring, it leaves behind the conditions of interlocution and dialogue. One cannot even say that it is engaged in monologue, inasmuch as monologue retreats from the dialogue it presupposes by interrupting it. What is left to say about this unanchored *I*? By its very obstination in wanting to doubt, it attests to a will to certainty and to truth – at this stage we are not distinguishing between the two expressions – which give to doubt a kind of orientation. In this sense doubt is not Kierkegaardian despair; quite the opposite, the will to discovery is what motivates it, and what I want to discover is the truth of the very thing that is put into doubt, the fact that things actually are as they appear to be. In this respect, it is not insignificant that the hypothesis of the malignant demon is that of a great deceiver. The deceit consists precisely in making seeming pass for "true being" (ibid.). By doubt "I persuade myself that nothing has ever existed"; but what I want to find is "something that is certain and true" (ibid.).

This final remark is capital if we are to understand the turn-around from doubt to the certainty of the *Cogito* in the second *Meditation*. This turn-about contains three decisive moments. First moment: in accordance with the ontological aim of doubt, the first certainty derived from the doubt itself is the certainty of my existence, implied in the very exercise of thought in which the hypothesis of the great deceiver consists: "Doubtless, then, I exist, since I am deceived; and, let him deceive me as he may, he can never bring it about that I am nothing, so long as I shall be conscious that I am something" (*Meditation II*). This is indeed an existential proposition: the verb "to be" is taken absolutely and not as a copula: "I am, I exist". The reader familiar with the *Discourse on Method* may be surprised not to find here the celebrated formula: *Cogito ergo sum*. Yet it is implicit in the formula: I doubt, I am. In several different ways: first of all, doubting is thinking; next, the "I am" is connected to doubt by a "therefore", reinforced by all the prior reasons for doubting, so that the statement must be read:

"In order to doubt, one must exist". Finally, the first certainty is not on the order of feeling; it is a proposition: "So that it must, in fine, be maintained, all things being maturely and carefully considered, that this proposition I am, I exist, is necessarily true each time it is expressed by me, or conceived in my mind" (let us leave aside, for the moment, the restriction; "each time it is expressed by me"; it will play a decisive role in what I shall later call the *crisis of the Cogito*).

However, if the first certainty is indeed an existential one, it is immediately followed by a second certainty inseparable from the first: I am a thinking thing. This development of the first certainty is provoked by a question: "But I do not yet know with sufficient clearness what I am, though assured that I am" (ibid.). And again: "I am conscious that I exist, and I who know that I exist inquire into what I am" (ibid.). This passage from the question *who* to the question *what* is prepared by the use of the verb *to be*, which oscillates between the absolute use: "I am, I exist" and the predicative use: "I am something". Something, but what? The reply to this question leads to the full formulation of the *Cogito*: "I am therefore, precisely speaking, only a thinking thing, that is, a mind, understanding, or reason – terms whose signification was before unknown to me" (ibid.). By the question *what*, we are led into a predicative investigation, concerning that which "belongs to the knowledge I have of myself" (ibid.) or even more clearly, "(that which) appertains to my proper nature" (ibid.). Here there is a new sifting of opinions by methodical doubt, a sifting similar to that of the first *Meditation*, but now the stakes involve the list of predicates attributable to this *I* certain of existing in the nakedness of the *I am*. The *I* completes its loss of all singular determinations in becoming thought; that is, understanding. One will nevertheless remark that in the expression, 'a thinking thing', the *I* receives the status of predicate, but the thought that is attributed to it itself remains without any determinants. This point is crucial for understanding the sort of retraction contained in the third *Meditation* concerning the triumphant status of the *I think*. If thoughts are said to "belong" to thinking, these thoughts which introduce a diversity into the *Cogito* are not considered in relation to their representative value, which, as we shall see, is very uneven but in relation to the sheer fact of their belonging to the subject, ensuring their complete equality.

The last remark leads us to the third and final moment of the reflexive conquest. The multiplicity of ideas, even when they are cut off from their representative value, brings us to distinguish different modes within thinking itself, that is to say, families of ideas corresponding rather well to the illocutionary acts in the theory of speech-acts". But what is a thinking thing? It is a thing that doubts, understends (conceives), affirms, denies, wills, refuses, that imagines also, and perceives" (ibid.). This enumeration poses the question of the identity of the subject, but in an entirely different sense than the narrative identity of a concrete person. It can only be a question here of a sort of point-like, ahistorical identity of the *I* in the diversity of its operations. This identity is that of a *same*, which escapes the alternatives of permanence and change in time, since the *Cogito* is instanteneous. It is worthwhile to cite the argument here: "For it is of itself so evident that it is I who doubt, I who understand, and I who desire, that it is here unnecessary to add anything by way of rendering it more clear" (ibid.). What is evident here concerns the impossibility of separating any of these modes from the knowledge I have of myself, hence from my true nature. Consequently, the evidence *that* I am, already extended to *what* I am, also covers the identity of the ego in the instantaneous diversity of its acts. The sameness of the self is ascribed to the self-evidence of the *Cogito*. This argument will be contested by Nietzsche in the famous last section of the *Will to Power*.

At the conclusion of the second *Meditation*, the status of the meditating subject seems to be totally unrelated to what, within the framework of ordinary language, we call person, agent, speaker, subject of imputation, character of narration. As we began to say in connection with the subject of the doubt, the subjectivity that posits itself by reflecting on its own doubt, the doubt that is made even more radical by the fable of the great deceiver, is an *unanchored* subjectivity, which Descartes, preserving the substantialist vocabulary with which he thinks he has broken, can still call a *soul*. But he really means the opposite: what the tradition calls a *soul* is, in truth, a subject, and this subject is reduced to the simplest and barest act, that of thinking. This act of thinking, still without any determined object, is enough to conquer doubt because doubt already contains it. And since doubt is voluntary and free, thought posits itself in positing doubt. It is in this sense that the "I exist as thinking" is a primary truth, that is to say, a truth that nothing precedes.

2. THE CRISIS OF THE *COGITO*

And yet . . .

And yet, the very status of primary truth assigned in this way to the *Cogito* contains all the seeds of what earlier I termed, by anticipation, the *crisis of the Cogito*. The question, indeed, is to know how and at what cost a second truth can be added to this first one. Descartes offers us a guide, the *order of reasons*. But two different aspects are to be distinguished in this order: the analytical order (in the sense of geometers) which is the order of discovery or *ordo cognoscendi*, and the synthetic order, that of the "truth of the thing" or *ordo essendi* (Guéroult 1953). According to the first order, the *Meditations* move from the ego to God, then to mathematical essences and, finally, to sensible things and to bodies. According to the second, God, simply a link in the first order, becomes the first ring. The *Cogito* would be truly absolute in all respects if one could show that there is only a single order, that in which it is actually first and which the other order sends back to the second level, derived from the first. Now, it does seem that the third *Meditation* reverses the order by placing the certainty of the *Cogito* in a subordinate position in relation to divine veracity, which is first according to the "truth of the thing".

In order to understand what is at stake in the third *Meditation*, we must first measure what the second has secured in the face of the challenge posed by the hypothesis of the great deceiver. The *Cogito* remains an exception to doubt inasmuch as certainty and truth coincide when "I represent my self to myself" (*Meditation III*); nothing guarantees the truthfulness of the clear and distinct ideas of anything else. Moreover, this certainty-truth lasts but the space of an instant, that of the act of reflection: "Perhaps if I were to cease thinking, I would cease to exist" (ibid.). How can we overcome the precariousness of an evidence confined to the instant?

The way out offered by the third *Meditation* is extremely subtle. It was admitted in the second *Meditation* that ideas which are the content of thought themselves participate in the certainty of thought insofar as they are inseparable from myself. But what belongs to me in this way are ideas insofar as they are present in me, abstracting from their representative value, what Descartes called their "objective being" in order to distinguish this from their "formal being", which puts them all on the same level, since they are all thought by me. The case is quite different if we consider ideas from the point of view of their representative value; they then present varyiny degrees of perfection. Equal insofar as they are thought, ideas are not so with respect to what they represent. Yet, Descartes continues, there is one idea that is distinct from all others: this is the idea of perfection, held to be synonymous with the philosophical idea of God; it is in me like all ideas but is endowed with a representative content out of proportion to my inner self, which is that of an imperfect being, condemned as I am to attain the truth along the arduous path of doubt. This is the astonishing situation: a content greater than its container. The question then arises as to the cause of this idea. With respect to all my other ideas, I could hold myself to be their cause, for they do not possess more being than I do. Of the idea of God, however, I am not capable of being the cause. Then it was placed in me by the very being that it represents.

I am not discussing here the innumerable difficulties that are related to each of the moments of this argument: the right to distinguish the objective being of ideas from their formal being, the right to consider the degrees of perfection of the idea as proportional to the beings represented in this way, the right to consider God as the cause of the presence of his own idea in me. I shall go directly to the consequences that concern the *Cogito* itself, surpassed in this way by the idea of the infinite or of perfection, incommensurable with its condition of finite being.

Even if the main accent in the third *Meditation* falls on demonstrating the existence of God, its effect on the *Cogito* is by no means negligible. It can be summed up as follows: "I am not alone in the world, ... but there is besides myself some other being who exists as the cause of that idea (the very idea of infinite and perfect being, the idea of God)". By a sort of rebound-effect of this new certainty – the existence of God – onto that of the *Cogito*, the idea of myself appears to be profoundly transformed by the sole fact of the recognition of that Other who brings about in me the presence of its own representation. I appear to be inhabited by an idea which cannot "come from me" (ibid.). But how did I get here? By changing the line of attack in the investigation of myself. Now I am investigating my *power* of "producing" my ideas and no longer the fact of having them, thinking them. It is with respect to this power that the idea of God differs from all the others: as regards the ideas of things, "they exhibit to me so little reality that I cannot even distinguish the object represented from non-being, (that) I do not see why I should not be the author of them" (ibid.). The accent indeed falls here on the self as *author* and not simply as the receptacle of ideas. It is this change in the line of attack that is decisive for the idea of God: it has so much more objective reality" than the idea I have of myself that it could not have "come from me". Instead, I have to say that the idea of God is logically prior to the idea of myself: "in some way I possess the perception of the infinite before that of the finite, that is, the perception of God before that of myself..." (ibid.). One must thus admit that, if God is the *ratio essendi* of myself, he becomes, as a result, the *ratio cognoscendi* of myself, insofar as I am an imperfect being, a *being that is lacking*. For the imperfection attaching to doubt is known only in the light of perfection; in the second *Meditation*, I knew myself as existing and thinking but not yet as a finite and limited nature. This infirmity of the *Cogito* extends a long way: it is not only related to the imperfection of doubt, but to the very precariousness of the certainty that conquered doubt, essentially to its lack of duration. Left to itself, the ego of the *Cogito* is Sisyphus condemned to climb back up, from one instant to the next, the rock of its certainty against the slope of doubt. On the other hand, because he preserves me, God gives the certainty of myself the permanence it cannot draw from itself. The strict contemporaneousness of the idea of God and the idea of myself, considered from the perspective of the power of producing ideas, makes me say that the idea of God "is innate, in the same way as is the idea of myself" (ibid.). Better yet: the idea of God is in me as the very mark of the author on his work, a mark that assures the resemblance between the two. I have finally to confess that "I perceive this likeness . . . by the same faculty by which I apprehend myself" (ibid.).

The fusion between the idea of myself and that of God could hardly be pushed any further. But what are the consequences of this for the order of reasons? The result is that this order is no longer presented as a linear chain but instead as a loop: of this rebound effect of the end point on the starting point, Descartes sees but the benefits, namely the elimination of the insidious hypothesis of a lying God who would nourish the most hyperbolic doubt; the fabulous image of the great deceiver is conquered in me as soon as the Other who is truly existing and entirely truthful has taken its place. For us, however, as for Descartes's first critics, the question is whether, by giving the form of a circle to the order of reasons, Descartes has not made the step that will tear the *Cogito* out of its initial solitude into a gigantic vicious circle.

It does seem that the reasoning of the third *Meditation* is still encumbered by an insurmountable equivocation. The stark choice that subsequent history will uncover continues to be in Descartes a comfortable one: it is presented as the interweaving of two competitive orders, that of subjective reasons and that of the objective truth of the thing. Descartes thought he could pass smoothly from one to the other, by substituting in the examination of the ideas contained in thought the point of view of their representative value in the place of their merely belonging to the *Cogito*, and by assigning to this representative value and equivocal existential status: "objective being". With objective being we are still in the *Cogito* and already *outside* the *Cogito*. We are still in the *Cogito* to the extent that the degrees of perfection of the objective reality of each idea possess evidence of the same nature as that of the *Cogito* itself, due to the fact that objective reality is that of ideas and that ideas cannot be separated from my nature. We are, nonetheless, *outside* the *Cogito* to the extent that the hierarchy of the degrees of perfection is measured by the highest among these, the idea of infinity, which, to be sure, is in me as an idea but is not pruduced by me – as it has more perfection than I do, I who doubt.

It is this pivotal position of "objective being", half-way between subjective certainty and objective truth that has not stood up to criticism. What has actually been perceived is the break up of the order rather than its continuity, by, among others, the authors of the *Second* and *Fourth Objections*, and even more clearly by modern interpreters of Descartes, who come after the dilemma of modern subjectivity has made its appearance on the great stage of history. In the expression: "the objective being" of the idea, the term "being" is primary. Now, what can assure me that the being of the idea shares the evidence of the *Cogito*? And if it does not share this certainty, it introduces a heterogeneous element that renders the certainty of the *Cogito* useless and sterile. Can it be said that the consciousness of my finite nature can simply be added, without occasioning any break, to the naked consciousness of my existence as thinking? But this union is heterogeneous to the extent that the latter depends on me and so comes from me, whereas the former does not come from me and in this sense does not depend on me. Besides, once the union is operated between certainty of existing as thinking and the truth of finiteness, the former seems not only incomplete and unfinished but genuinely truncated: what indeed is a thought, abstracting from its unequal content and from the principle that governs this very inequality? If it is true that the union between the idea of myself as finite and imperfect and the idea of God as infinite and perfect is indissociable and original in our primary consciousness, then how could I form the first certainty in feigned ignorance of this union? Are we to say that this union rests on the original union of my consciousness and its contents? But there is a sharp discontinuity between the principle of uncertainty of the former and the principle of truth belonging to the latter. Henceforth, if we take seriously the transmutation by which the *Cogito* passes from the second to the third *Meditation*, we must then say that the *Cogito* separated from the consciousness of God cannot go beyond the plane of common sense, with which the *Cogito* was supposed to have made a clean break.

But then, without falling to the level to which Spinoza relegates it, the *Cogito* loses its character of first truth to the extent that the idea of myself, separated from the idea of God, "is but the denatured image of myself" (M. Guéroult, *Descartes selon l'ordre des raisons*, Aubier, 1953, pp. 244–5): "In reality there is no consciousness which is not at the same time the consciousness of God (that is to say, of its own imperfection, etc. . .): the true *Cogito* is the *Cogito* attached to God" (ibid., 244).

A choice seems open to us here: either the *Cogito* has the value of a foundation, but then it is a sterile truth which cannot be pursued without a break in the order of reasons; or it is founded on its finite condition of the idea of perfection and the first truth loses its halo of first foundation.

This choice has been transformed by Descartes' heirs into a dilemma: on the one hand, Malebranche, and Spinoza even more so, drawing the consequences of the reversal performed by the third *Meditation*, saw in the *Cogito* no more than an abstract, truncated truth, stripped of all prestige; Spinoza is, in this respect, the most coherent: for the *Ethics*, the discourse of infinite substance alone deserves to be a foundation; the *Cogito* is not merely relegated to the second level, but it loses its formulation in terms of the first person. At the start of Book II of the *Ethics*, we thus read: "man thinks". An axiom precedes this lapidary formula, Axiom I, which stresses the subordination of the latter: "the essence of man does not include necessary existence, that is to say, it may just as well be, following the order of Nature, that this or that particlar man exist, as that he not exist." The problematic of the self moves away from the philosophical horizon. On the other hand, for the entire movement of philosophical idealism, by way of Kant, Fichte and Husserl, (at least the Husserl of the *Cartesian Meditations*) the only coherent reading of the *Cogito* is the one in which the alleged certainty of God's existence is marked with the same seal of subjectivity as the certainty of my own existence; the guarantee constituted by Divine veracity, behind the *Cogito* as self-positing, does not then constitute more than an appendix to the primary certainty. If this is the case, then the *Cogito* is not a primary truth that would be followed by a second and a third, an *n*th truth, but the foundation that founds itself, incommensurable to all propositions, Transcendental as well as empirical. In order to avoid falling into subjective idealism, the "I think" has to be stripped of all psychological resonance, and all the more so, of all autobiographical reference. It has to become the Kantian "I think", which the transcendental Deduction states "must be able to accompany all my representations". The problematic of the self leaves this in a sense magnified, but at the cost of the loss of its relation to the person of whom one speaks, to the I-you of interlocution, to the self of responsibility, to the identity of the historical person. Must we choose between humiliation and exaltation? Modernity at least owes a debt to Descartes for having been placed before such a formidable choice.

REFERENCES

Descartes, René: 1979, *Mediations on First Philosophy*, Hackett, Indianapolis.
Guéroult, M.: 1953, *Descartes selon l'ordre des raisons*, Aubier-Montaigne, Paris.

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Part III
Meditation and Doubt

[6]

Gary Hatfield

DESCARTES'S *MEDITATIONS* AS COGNITIVE EXERCISES

Descartes's *Meditations on First Philosophy* have the form of meditations. This fact about the literary form of Descartes's chief work of metaphysics has been noted before and is now receiving growing attention.[1] Part of this attention derives from a more general interest in the literary forms of philosophical works, an interest that no doubt has been spurred by the efforts of literary theorists.[2] My own interest in this aspect of the *Meditations* has arisen from an attempt to achieve greater philosophical understanding of this work. The way in which the work was written has implications for the way in which it must be read: for how we must read it in order to understand (parts of) it at all, and for the activity that must constitute its reading according to Descartes's conception of philosophical knowledge.

The idea of deriving philosophical benefit from taking seriously the form in which the *Meditations* was composed may be illustrated by the light that is shed on Descartes's so-called method of doubt. Usually, Descartes's method of doubt is placed in the context of two intellectual currents against which Descartes was reacting: skepticism and scholastic Aristotelianism. The doubt of the First Meditation serves as a way to undermine (Aristotelian) orthodoxy by overturning the apple cart. Further, the well-worn arguments of the skeptics are raised in order to show that they can be refuted (in subsequent Meditations), and to underscore the high degree of certainty of Descartes's own doctrines, which will be established in the face of stringent skepticism. But these functions of the doubt do not reveal its special use in the *Meditations,* which derives from the fact that the work was cast in the form of meditations. As Descartes maintained in response to Hobbes's complaint that the First Meditation vends stale goods, an essential function of the doubt is "to accustom the reader's mind to consider intelligible objects and distinguish them from corporeal things — and to this end such doubts are indispensable" (H&R, II, p. 61).[3] The doubt itself does not "accustom" the mind to consider intelligible objects, but it provides a means for suspending judgment about corporeal things and drives one to a last refuge of certainty in the direct apprehension of one's own thought. It serves as a kind of exercise for the mind. It is, I shall argue, indispensable in this regard because it provides the means for freeing one's attention from sensory ideas in order to attend to an independent source of knowledge: the pure deliverances of the intellect. It thus serves a function in Descartes's *Meditations* similar to that of doubt and other "purgings" of the senses in the tradition of spiritual meditation stemming from St. Augustine.

According to the reading I shall offer, Descartes's use of the meditative mode of writing was not a mere rhetorical device to win an audience accustomed to the spiritual retreat. His choice of the literary form of the spiritual exercise was consonant with, if not determined by, his theory of the mind and of the basis of human knowledge. Since Descartes's conception of knowledge implied the priority of the intellect over the senses, and indeed the priority of an intellect operating independently of the senses, and since, in Descartes's view, the untutored individual was likely to be nearly wholly immersed in the senses, a procedure was needed for freeing the intellect from sensory domination so that the truth might be seen. Hence, the cognitive exercises of the *Meditations*.

This reading entails a distinctive attitude toward the role of argument in the *Meditations*. Although works of religious meditation may make use of argument, their purpose is not to present a continuous argument that compels by force of logic; they serve as guidebooks to prepare the soul for illumination from above or within. Similarly, Descartes's *Meditations* are not so much a continuous argument as a set of instructions for uncovering the truths that lie immanent in the intellect. Not that there are *no* arguments in the *Meditations*; the language of argument is interspersed throughout the work. But some conclusions seem to arrive out of nowhere, without discursive argument — such as the conclusion that the essence of matter is extension, or that one can discover in one's thought the idea of an infinite, benevolent being. I want to suggest that Descartes's work is constructed in such a way that the force of such conclusions depends upon the ability of the meditative exercises to evoke in the reader certain experiences that bring their own content and carry their own conviction. The *Meditations* must evoke the appropriate cognitive experiences in the meditator.

I

My argument depends upon establishing with some exactness the relationship between Descartes's *Meditations* and the types of spiritual exercises available to him in the Roman Catholic tradition. Although virtually all devotional literature in the early seventeenth century shows the influence of Augustine, a division may be made into groups that I will call Ignatian and Augustinian. This division reflects differing accounts of the cognitive basis of meditative experience implicit or explicit in various writers. Ignatius assumes an Aristotelian account of cognition; writers in the Augustinian tradition, such as Eustace of St. Paul, reveal the influence of Augustine's neo-Platonic bent.[4] Descartes would have been familiar with both traditions, the Ignatian from his Jesuit school days, the Augustinian from his contact with the Parisian Oratory during the 1620s.

By the early seventeenth century a generalized structure had insinuated itself into meditative writing, the essentials of which were expressed in Ignatius's *Exercises* (1548) and the attendant *Directory* (1591), and had been implicit in Augustine's *Confessions*. This generalized structure may be summarized according to two trinitarian doctrines: the three powers and the three ways. The "three powers" refers to three powers of the soul—memory, understanding, and will—and enjoins that meditation should engage each of these. The memory, including imagination, is used to contemplate various subject matters, such as original sin, hell, or the passion of Christ. Where possible, the meditative text will aid in calling forth vivid images of the fires of perdition or of the suffering of the Savior. The understanding then draws implications from the object lesson (e.g., hell should be avoided), with the end of raising affections in the will (e.g., the desire to follow steadfastly the example of Christ) and strengthening its resolve (e.g., to avoid the evil of sin). The guidance of the will is the ultimate objective of meditation.

The second doctrine parallels the first by introducing three "ways" or stages through which the meditator should pass. In the first of these, the purgative, the body is mortified, so that one may turn away from sin, the senses, and sensuality. This prepares the soul for the illuminative way, in which one endeavors to a positive exercise of the Christian virtues by becoming aware of the moral power of the soul through the example of Christ or by other divine illumination. Souls that have achieved illumination may then enter the unitive way, seeking union with God through the joining of one's own will with the divine will.

Parallels between these formal doctrines and the structure of Descartes's

Meditations are striking. The three ways, leading away from the world to God, are paralleled by Descartes's meditator, who "purges" the senses and even the perception of simple mathematical truths (First Meditation), is illuminated by the *cogito* and by the knowledge of God (Second and Third Meditations), and seeks to direct his will in the manner intended by God (Fourth Meditation). Moreover, one sees in various meditations the use of the three faculties—memory, understanding (or intellect), and will. Hence, at various places in the First Meditation the meditator recalls (a) that what he has accepted as true to this time was known by means of the senses and that the senses have deceived him, (b) instances of being deceived by dreams, and (c) "the old opinion that there is a God who can do everything" (A&G, p. 63). From these remembered notions together with other considerations the understanding draws various conclusions about the deceptiveness of the senses and the possibility of delusion even about mathematics. The Meditation ends with the meditator focusing upon the grounds for doubt, and even positing the evil deceiver, as means for strengthening his will so that he may withhold assent from his old, possibly erring opinion (see also the "resolutions" of the will at the end of the Second and Fourth Meditations).

A second type of parallel is not revealed by the formalized doctrines just discussed. Meditations carried their force in at least two ways. First, they brought forward "considerations" that could appeal to the understanding; these were cast in the form of discursive argument. Second, they exemplified various matters directly to the mind, as in a direct vision of God, or as Christian virtue is exemplified in a contemplation of the life of Christ. Here one was not supposed to be persuaded by argument, but rather to become immediately acquainted with God or to gain practice in directing the will toward virtue. Especially in the Augustinian tradition, exemplification involved illumination of the intellect and will by divine light, yielding direct apprehension of eternal truth (or of the supreme good) akin to Platonic contemplation of the Forms.

Similarly, Descartes's *Meditations* contain both argument and exemplification. Sometimes argument is used in the service of exemplification, as when the skeptical arguments of the First Meditation are used, not to achieve a positive conclusion, but to suspend judgment in order to uncover something that is immediately and indubitably known. Much of the rest of the *Meditations,* which comes out looking rather odd when treated as argument, is quite naturally seen as exemplification. Thus, the briefly sketched argument to the conclusion "that the proposition 'I am,' 'I exist,' whenever I utter it or conceive it in my mind, is necessarily true"

(A&G, p. 67) is ultimately presented as resting upon the direct apprehension of the meditator's own thinking (H&R, II, p. 207). This direct apprehension requires that the mind "must be abstracted from the senses," an achievement that is prepared for by the doubt of the First Meditation (see also H&R, II, pp. 60–61), and realized in the Second Meditation's meditation on the human mind (see also H&R, II, p. 32). The conclusion of *sum* from *cogito* is regarded as established not by argument, but by "recognizing it as something self-evident, in a simple mental intuition" (A&G, p. 299; see also A&G, pp. 300–301), and is recalled as such at the beginning of the Third Meditation. This intuition is not attained by the *cogito* argument itself, but by the succeeding investigation of "this 'I' that necessarily exists" (A&G, pp. 67–71).

Exemplification in intuition is at work at other key points in the text. Thus, at various places before Descartes's meditator draws the mind-body distinction, he gives the reader practice at conceiving the mind as thinking and nonextended (Second Meditation, A&G, pp. 68–70, 76; Third Meditation, A&G, p. 84; Fourth Meditation, A&G, p. 92). When he asserts at the opening of the Fifth Meditation that extension is what is clearly known in body, he neither gives an argument there nor relies on a previous one; however, he can rely on previous instances of exercising the mind in the perception of particular bodies as extended, as in the thought experiment with the piece of wax in the Second Meditation (A&G, pp. 72–73), which is recalled and generalized in the Third Meditation (A&G, p. 83). Hence, exemplification provides both the immediate apprehension that extension constitutes the essence of material things, and the apprehension that thought is completely distinct from extension, thereby providing the crucial premises for the argument to God's existence (Third and Fifth Meditations). And so exemplification importantly underlies the chief metaphysical conclusions of the *Meditations,* regarding mind, matter, and God.

The appeal to exemplification and illumination reveals the extent to which meditative literature depends upon the evocation of experiences in the reader. By carefully arranged settings and preparatory exercises, the reader is brought into the proper state to receive the light of grace (in spiritual meditations) or to perceive the unvarnished truth by the light of nature (in Descartes's cognitive exercises). In consonance with the experiential thrust of the practice of meditation, the meditative text itself often contained an explicit theory of cognitive function — as in the doctrine of the three powers — that explained the role of the various cognitive faculties in the reception of illumination. Descartes's *Meditations* were no exception.

In his account of the cognitive base of meditation, Descartes radically broke with the mainstream Ignatian tradition and turned to the tradition stemming from Augustine. The mainstream reflected in a broad way the teaching of Thomas Aquinas, and laid heavy stress on the use of the faculties of memory and imagination. Aquinas himself, with his Aristotelian, sense-based epistemology, contended that (revelation aside) God can be known only by means of our sensory contact with His creation. Correspondingly, Aquinas stressed the role of sensible objects in meditation, and especially recommended applying the imagination to the passion of Christ.[5] In the tradition of formal meditation, this emphasis on imagination was heightened — Ignatius invites one to see, feel, hear, taste, and smell the horrors of hell — and the role of the understanding was limited to drawing consequences from imagined material. In this tradition, the meditator turns away from mundane sensory and sensual distractions for a period, the better to focus the mind upon spiritually uplifting sensory materials constructed by the imagination.

Augustine, in contrast, searches memory (and imagination) through and through, and does not find God. God cannot be found in memory, because He is not known by way of image, as are corporeal things (VII, 36).[6] Indeed, in the *Confessions* Augustine returns again and again to the theme that it was his attempt to conceive God as extended in space, and therefore as able to be portrayed in the imagination, that had prevented him from knowing the deity (e.g., IV, 31; VI, 4). In order to see God, he needed "to brush away the swarm of unclean flies that swarmed around the eyes of my mind" (VII, 1). The clearing of an intellectual vista to the deity was achieved by sweeping away his earlier (Manichean) opinions through the clever ploy of adopting a skeptical doubt (V, 19 and 20). The skeptical doubt then dissolves in the face of a direct vision of God, which itself was achieved through contemplating the immateriality of his own mind.

> And thus by degrees I was led upward from bodies to the soul which perceives them by means of the bodily senses, and from there on to the soul's inward faculty, to which the bodily senses report outward things — and this belongs even to the capacities of the beasts — and thence on up to the reasoning power, to whose judgment is referred the experience received from the bodily sense. And when this power of reason within me also found that it was changeable, it raised itself up to its own intellectual principle, and withdrew its thoughts from experience, abstracting itself from the contradictory throng of fantasms in order to

> seek for that light in which it was bathed. Then, without any doubting, it cried out that the unchangeable was better than the changeable. From this it follows that the mind somehow knew the unchangeable, for unless it had known it in some fashion, it could have had no sure ground for preferring it to the changeable. And thus with the flash of a trembling glance, it arrived at *that which is.* And I saw thy invisibility understood by means of the things that are made. (VII, 23)

By turning away from the senses and discovering his own intellect as an invisible, immaterial, and yet mutable power, he was led to see with the fleshless eye of the mind the invisible, immaterial, immutable deity. For one who wished to follow Augustine in his process of contemplation, the doubt and subsequent turning away from the senses ("the contradictory throng of phantasms") would not be undertaken in order to provide the proper frame of mind for examining new sensory and imaginal materials; rather, the senses and imagination would be neglected because they cannot possibly afford knowledge of God or the soul. Only the intellect turning inward can know the immaterial.

Here then is a model for the *Meditations* of Descartes, in which the meditator uses skepticism and contemplation of his own thought to withdraw the mind from the senses, and then, having fought off the "images of sensible objects" that blind the "mind's eye" (A&G, p. 87), achieves contemplation of God ("the beauty of this immeasurable light," A&G, p. 91). Consistent with the Augustinian character of the *Meditations,* Descartes repeatedly stresses the importance of the skeptical doubt, and of the *cogito,* as means for bringing the appropriate cognitive resources to bear in his search for first truths. The clear and distinct perception of his own existence yields a "great illumination of the understanding," which prompts a "great inclination of the will" to judge what is so understood to be true, thereby nullifying the force of skeptical doubt and hesitation (A&G, p. 97). A will momentarily unfettered by prejudice and habit can seek truth in an autonomous faculty of understanding. Descartes reviews the progress of the first three Meditations in just these terms: "In the last few days I have accustomed myself to withdraw my mind from the senses; I have been careful to observe how little truth there is in our perceptions of corporeal objects; how much more is known about the human mind, and how much more again about God. I thus have now no difficulty at all in turning my thoughts from imaginable objects to objects that are purely intelligible and wholly separate from matter" (A&G, p. 92). As he remarks in the *Objections and Replies,* he has chosen the meditative mode of writing because of the great difficulty in arriving at a clear and distinct perception of the primary notions of metaphysics: "For, though in their own nature they are as intelligible as, or even more intelligible than those the geometricians study, yet being contradicted by many preconceptions of our senses to which we have since our earliest years been accustomed, they cannot be perfectly apprehended except by those who give strenuous attention and study to them, and withdraw their minds as far as possible from matters corporeal" (H&R, II, pp. 49–50). Descartes repeatedly emphasizes the need to spend days and weeks in the study of each Meditation (e.g., H&R, II, p. 31), not merely because the subject matter is difficult and full attention is required, but because he is asking the reader literally to think in a new way. Descartes's meditator does not forsake things sensory merely to avoid interruption, but to discover a new manner and object of thought. The meditative mode of writing is chosen because it invites one to turn inward, and that is where Descartes believed his metaphysical first principles were to be discovered, lying immanent in the intellectual faculty of the meditator.

The Augustinian character of Descartes's *Meditations* can be consolidated by reflection on the differing uses of the faculty of memory in that work. We have seen that meditations in the tradition of Aquinas and Ignatius employ the memory as a source of materials for contemplation. Augustine could not find God in memory, but at first could remember only his mistaken search for God among corporeal things; later he uses memory as a repository for knowledge of the deity achieved through illumination. Descartes uses memory as a source of materials for contemplation primarily in the First Meditation, where he recalls various "old opinions" — such as that the senses are the chief source of knowledge — as well as recalling various reasons for doubting these old opinions — such as the possibility of a deceiving God (since this idea is *recalled,* not perceived directly by the intellect, a deceiving God is a possibility). Prior to the illumination of the *cogito* and the actual contemplation of God, the meditator is reasoning within the domain of common experience and belief; memory is a repository of commonly accepted errors. As the meditator initiates his search for an Archimedian point, he forsakes memory (and thereby tradition, except as a source of old, erroneous opinions), and searches his own immediate experience. Memory then becomes a means for retaining the knowledge gained through the *inspectio* of the *cogito* and the idea of God (A&G, pp. 75, 100, 107).

Despite the numerous parallels between Descartes's work and Christian meditation, a wide gulf separates the two. In each case the purpose of meditation is constructive: the meditator is to be transformed, through achieving a new understanding and through the reformation of the will. But the types of understanding and reformation are distinct. The Christian seeks new understanding and acquaintance with God in order to guide the will in attaining Christian virtue. Descartes's meditator achieves knowledge of God, but does so in the service of gaining a better acquaintance with his own cognitive faculties, ultimately in order to recognize the strengths and limitations of human understanding and to curb the source of its error in the impetuous will. The Christian returns from meditation with a firmer resolve to avoid sin (or moral error) and to embrace virtue. Descartes's meditator returns from contemplation with a firmer resolve to avoid epistemic error and to seek the truth, in the hope of establishing "some secure and lasting result in science" (A&G, p. 61).

When Descartes was in school the Jesuit practice was to hold an extended spiritual retreat once each year. The Augustinians of the Oratory also were fond of the retreat. Descartes, however, counseled a *cognitive* retreat only once in a lifetime. He wrote to Elizabeth in June of 1643:

> I think it is very necessary to have understood, once in a lifetime, the principles of metaphysics, since it is by them that we come to the knowledge of God and of our soul. But I think also that it would be very harmful to occupy one's intellect frequently in meditating upon them, since this would impede it from devoting itself to the functions of the imagination and senses. I think the best thing is to content oneself with keeping in one's memory and one's belief the conclusions which one has once drawn from them, and then employ the rest of one's study time to thoughts in which the intellect cooperates with the imagination and the senses. (K, p. 143)

Descartes seems to be saying that once one has, through metaphysical meditation, achieved a knowledge of the principles of metaphysics, one then should return to the affairs of the world (just as Augustine used the memory of God as a source of strength for confronting worldly affairs). Descartes's meditator returns to the world not only with a fresh knowledge of God and the soul, but also with a fresh understanding of the nature of corporeal things. With the metaphysical knowledge that extension is the essence of matter firmly implanted in memory, the meditator is prepared to employ the senses and imagination in the investigation of nature.

A final, fundamental point of comparison underscores the autonomy of the meditator. Mystical and meditative writings stress the experience of the meditator himself. Although spiritual exercises might be guided by a director, the individual seeks his own experience of God. The instructions of the director and the guidance of the text itself become secondary to the individual's personal illumination. Yet this illumination is not held out as something the individual can achieve on his own. No human aid may be required, but meditators from Augustine to Eustace of St. Paul recognized the dependence of the exercitant on the assistance of faith granted through divine grace. In Eustace's *Exercices Spirituels* (1630), the meditator purges not only the senses and imagination, but the intellect as well, thereby abandoning the human faculty of judgment in the hope of illumination from on high (I, 19). The success of meditation for achieving union with God ultimately depends on the inscrutable dispensation of grace.

For his pursuit of permanent results in science, Descartes makes the autonomy of the meditator absolute. This autonomy emerges parenthetically in the synopsis of the *Meditations*: "I do not intend to speak of matters pertaining to Faith or the conduct of life, but only of those which concern speculative truths, and which may be known by the sole aid of the light of nature" (H&R, I, p. 142). Descartes's meditator never forsakes his own faculty of judgment, or "natural light"; early in the Third Meditation, he explicitly puts its deliverances absolutely beyond doubt (A&G, p. 79). Moreover, the autonomy of the meditator is not diminished by his conclusion that the trustworthiness of the natural light derives from its source in God (and therefore that a knowledge of God is necessary to avoid skepticism and achieve lasting science), for that conclusion itself is derived under the aegis of the natural light. Furthermore, this divine gift is dispensed equally to all (K, p. 66), so no one can claim special illumination regarding matters that fall within the purview of human reason (as opposed to matters of faith). As befits one whose aim was to secure an independent stance for natural science, Descartes never makes the search after truth dependent upon the grace of God. The investigation of nature may proceed independently of revealed doctrine.

II

Descartes's elaboration of a meditative mode of arriving at metaphysical first truths reflected his doctrine that the intellect constitutes a source of knowledge distinct from the senses. This non-Aristotelian doctrine of the autonomy of the intellect required a reconception of the relationship between the intellect and the senses. At the core of the Aristotelian conception of the knower lay a sense-based epistemology, which was distilled into the slogan, "Nothing is in the intellect that was not first in the senses." As elaborated by Thomas Aquinas and subsequent scholastic Aristotelians, this implied that all knowledge, including knowledge of God, the soul, and the truths of mathematics, is attained by the intellectual abstraction of universals from sensory particulars.[7] In the course of the *Meditations,* Descartes reaches the opposite conclusion, that the things known first and known best are not known by or through the senses, but through the independent operation of the intellect. Descartes's replacement dictum might be phrased, "Nothing is accepted from the senses, that was not first in the intellect." In the reformed hierarchy of knowing faculties the intellect stands autonomous and supreme. The radical upshot is that the metaphysical picture provided by the intellect will guide the formation of a new theory of the senses and the construction of a new science of nature (with the aid of sensory observation and experiment).

Although the senses no longer could play the exalted role of providing the only content for thought, Descartes's intellectualism did not allow him to ignore their role in cognition. His abiding concern with natural science demanded an investigation into the possibility and reliability of sensory knowledge of natural things; for, no matter to what extent the intellect dominates the senses, the object of study in the investigation of nature — the corporeal, "visible" world — can be known in its details only by means of the senses.

Descartes maintained that although the senses themselves do not deceive, they provide material for error in the obscure sensations of color, sound, heat, etc. These sensations are obscure in that they do not in themselves afford a knowledge of what color, sound, heat, etc. *are* (when considered as properties of objects): i.e., they do not reveal that these properties are dispositions of the size, shape, and motion of the minute corpuscles of objects (and their surrounding media) to produce sensations in us. Nonetheless, owing to the prejudices of childhood, we habitually judge that these sensations provide us with immediate knowledge of the properties of objects, and in fact that external objects implant in us through the senses a "likeness" or "picture" of themselves or indeed that sensations "resemble" the properties of objects (A&G, pp. 78–80); for "since I had no conception of these objects from any other source than the ideas themselves, it could not but occur to me that they were like the ideas" (A&G, p. 112). It is this habitual childhood (and Aristotelian) prejudice that must be corrected by the mature intellect.

Descartes's "no resemblance" doctrine of sensory qualities such as color constituted a major break with the Aristotelian account of the senses. His new account introduces a sharp division between color as a property of objects, together with its effect on the medium and the nervous system, and the sensation of color experienced by the mind. The mental experience of phenomenal color (resulting from pineal agitation) falls under the mystery of mind-body interaction (A&G, pp. 116–17); its physical and physiological causes may be investigated through the clear and distinct conceptions of mechanistic physics (e.g., H&R, II, pp. 251–54).

Descartes's new doctrine raised a new problem of explanation and justification — namely, to show why color in objects should be thought of geometrically and mechanistically rather than as a real or primary property. In the sentence quoted above, Descartes adumbrates that this justification must come from a source other than the sensory ideas themselves. What are the candidate sources? One might suppose that the mechanistic physics itself does all the work that need be done here, by providing a clear and compelling account of the operation of the senses. But notice that this account appeals to microproperties of objects, sensory media, and the nervous system, which are at best inferred. Why should one accept a mechanistic rather than Aristotelian account of the senses in the first place? This poses a general question about the sources of knowledge that frame both particular sensory judgments and the theory of the senses itself, and forces us to come to grips with the status of the intellect as an independent source of knowledge.

Prima facie, it is difficult to see why color as we experience it should be regarded as confused and obscure in comparison with shape. Phenomenally, color seems no more "out of focus" — confused and obscure — than the other dimensions of visual experience. Descartes granted as much in the *Principles*: "Pain, color, and so on are clearly and distinctly perceived when they are considered merely as sensations or thoughts" (H&R, I, p. 68; A&G, p. 194; see also A&G, pp. 78–80). The difference comes when ideas are regarded as representing something external to the mind that has them; it is by comparison with the external standard of material nature itself that some sensory ideas are regarded as confused representations of their objects, whereas others are deemed clearer. But how is this comparison to be effected? If one proceeds empirically, it is difficult to see how to give a straightforward justification to the claim that ideas of shape more clearly represent the actual properties of objects than do ideas of color. Shape seems no more primitive and fundamental to our sensory experience than does color: colored things are always experienced as spatially articulated, but nothing is experienced as spatially articulated unless it varies in lightness or color. Perhaps later authors could claim that spatiotemporal properties are more thoroughly entrenched in scientific discourse, but that is partially as a result of the program that Descartes helped launch.

Descartes sought to solve the problem by appealing to a criterion outside the domain of sensory ideas. The difficulty of sorting among phenomenally given sensory ideas in order to determine their representational value is by-passed through appeal to a source of knowledge by which one can directly determine the sorts of properties that material objects may possess. The greater clarity attending the perception of shape is not, in the first instance, sense-perceptual; it is intellectual. By the natural light of the intellect, the only aspect of material things that can be clearly perceived or understood is pure continuous quantity: the attribute of extension. Color is not even a starter, since the objects of pure geometry as perceived by the intellect do not possess any sensory qualities. When the corrective judgments of the intellect are brought to bear on sensory ideas, it can be directly intuited that color is at best an obscure and confused representation of the geometrical properties of corporeal objects. Its comparative obscurity is determined not by a direct comparison with shape as experienced through the senses, but with the intellectual apprehension of shape as a geometrical property.

This strategy for sorting out sensory ideas applies to the whole of nature. Descartes's claim is that a priori, the only sorts of explanations that can be considered in natural science are ones that appeal only to geometrical properties such as size, shape and motion. Metaphysics provides a way of discerning that nature is fundamentally geometrical: the *Meditations* provides the reform of the intellect needed to free one from the domination of the senses in order to grasp this intellectual truth. But metaphysics cannot lead one to particular mechanistic explanations of natural phenomena, since mathematical intuition *per se* gives no direct insight into the particular geometrical configurations of actually existing bodies. The latter must be determined by sensory observation and experiment: by positing particular mechanistic hypotheses, and checking the empirical plausibility of the posit. Metaphysics reveals what kinds of properties can be used in constructing hypotheses; sensory observation and experiment must be used to determine which of these constructions fit the actual order of things.

III

A reading of the *Meditations* as meditations brings into prominence the extent to which its arguments and conclusions depend upon its guidance of the reader to certain experiences. The indubitability of the *cogito,* the apprehension of thought as something known independently of the body, the idea of a benevolent Supreme Being, the pure conception of extension without attendant sensory qualities: these are the experiences upon which depend the success of the *Meditations* in establishing Descartes's First Philosophy.

My emphasis on the experiential thrust of Descartes's chief work may seem to yield an implausibly (or uncomfortably) psychologistic interpretation. In fact, Descartes has been ascribed "the glory of having determined the true character of the psychological method" for searching after truth, thereby setting Locke on the pathway of investigating the phenomena of human understanding in his *Essay.*[8] Although Descartes did enjoin one to turn inward and to discover the givens of one's own experience, his method cannot patly be described as introspective. For Descartes was not asking one simply to look within. He was not interested in his own or his readers' passing psychological states. Nor was he bringing the reader to an awareness of sense-data. Rather, he was hoping to aid one in discovering, through the process of meditation, a source of impersonal, objective judgments that lies hidden in the intellect. The meditator is to sift through his own experience until he arrives at that which compels assent, and is thereby to discover that which lies behind the possibility of universal agreement in such subject matters as mathematics and logic. Descartes's "introspective" discovery of clear and distinct perception presumes to have arrived at the experiential basis behind the demonstrations of geometry.

Descartes has the meditator seek illumination for himself through the cognitive exercises of the *Meditations.* The need to experience illumination for one's self may be understood through Descartes's methodological writings. In both the *Rules* (especially 5-7, 11) and the *Discourse* (Pt. II, A&G, p. 20), intuition serves as the starting point for all knowledge. The Cartesian method seeks to begin with what is intuitively certain and to derive consequences by steps which themselves possess intuitive certainty. A discursive argument hence takes its life from purely mental intuition. Intuition — or, in the language of the *Meditations,* clear and distinct perception or intellectual illumination — is the starting point and the support of all progress in demonstrative knowledge, and therefore in First Philosophy.

Intuition can only be had for one's self. Whether in geometry or metaphysics, proper judgment of the truth results only when one feels one's own will compelled to give assent — compelled not by any external factor, but by one's own intellectual apprehension (A&G, p. 96; H&R, I, p. 204). Descartes believed it more difficult to achieve self-illumination and self-guidance in metaphysics than in geometry. Geometry had achieved systematization and acceptance, presumably because its principles are among those "so clear that they may be acquired without any meditation" (H&R, I, p. 205). Metaphysics, while potentially possessing the certainty of geometry, appeared in relative disarray. Descartes explained in the Dedication to the *Meditations* that although the demonstrations contained therein "are equal to, or even surpass in certainty and evidence, the demonstrations of Geometry, I yet apprehend that they cannot be adequately understood by many, both because they demand a mind wholly free from prejudices, and one which can easily be detached from affairs of sense" (H&R, I, p. 135). Moreover, agreement was expected in geometry, and so the reader might be willing to give the benefit of the doubt. In metaphysics, Descartes was faced with the task of helping readers to achieve illumination despite prejudice or lack of faith. Hence, his requirement that one "meditate seriously" with him (H&R, I, p. 139).

Cartesian meditation is a method of discovery. Descartes explained his work in those terms in the second set of *Replies.* Pressed to formulate his First Philosophy in "geometrical fashion," he hesitantly complied, explaining the necessity for the meditative genre. While a geometrical exposition from definitions, postulates, and axioms has demonstrative force at each step, it does not reveal how these steps are arrived at, nor does it bring one to a direct intuition of the first principles. This may not be of great moment for the exposition of geometry, since "the primary notions that are the presuppositions of geometrical proofs harmonize with the use of our senses and are granted by all" (H&R, II, p. 49). (Presumably it would hinder geometrical *discovery* to proceed always in this fashion.) The primary notions of metaphysics are quite otherwise, Descartes lamented. Here the problem is not to carry out proofs (which might well be assented to given the definitions and axioms), but to discover the axioms themselves (which are hopelessly obscured by the prejudices of the senses). The reader cannot feel the intuitive force of these first principles until he apprehends them. Hence, the cognitive exercises of the *Meditations* are engineered to suspend prejudice through skeptical doubt, to exercise one's intuition through the illumination of the *cogito* and the proofs of God's existence, and to prepare one for the intuitive apprehension of mind and body as having distinct essences through the exercises of the Second Meditation, which are consolidated in the arguments of the Sixth Meditation. The *Meditations* are successful when they can be laid aside in favor of direct apprehension of the clear but remote principles of First Philosophy.

But does the sincere participant in a Cartesian retreat have the experiences called for by the *Meditations*? We are likely to have no problem in admitting the indubitability of the *cogito* (although the subsequent step to the separate substantiality of the mind will not find the same acceptance). But the same success will not be forthcoming with the appeal to an innate idea of God and to a direct mental perception of pure continuous quantity. Although both theism and mathematics persist, they do so without the cognitive foundations envisioned by Descartes.

What did Descartes have in mind in staking his claims on these experiences? He did not, I think, intend that what we might (inappropriately) call the "mere" (but nonetheless considerable) literary merits of the text should carry the day. Rather, his choice of the meditative genre reflected his serious commitment to invoking these experiences in the reader, in accordance with his methodology of intuition. That he could reasonably expect to do so for his audience, and that the expectation no longer is reasonable, reveals the extent to which this most ahistorically conceived of texts is historically conditioned.

Descartes could expect to invoke the appropriate responses in (some of) his readers because the *Meditations* drew upon two available practices: spiritual meditation and speculative mathematics. We have seen that in the Augustinian tradition of meditation, one sweeps away the sensory world in order to see God with the eye of the mind. Similarly, in a neo-Platonic mathematical tradition, one uses the imagination as a convenient aid to display the continuous proportions that are known to pure intellect.[9] No matter what the practitioners of these regimens actually did experience (could this be decided?), the account they gave of their practice included the intellectual apprehension of God on the one hand and of the objects of mathematics on the other. There existed communities of meditators and mathematicians in the time of Descartes who were used to describing their experiences in the manner of the *Meditations*.

Yet one cannot rest content with totally relativizing Descartes to this historical context, for his work continues to speak. One way in which it speaks is through its appropriation by philosophical traditions indifferent (or antipathetic) to Descartes's intellectualist metaphysics; as when the First Meditation is used as a standard statement of skepticism in the teaching of twentieth-century sense-data epistemology. Here, a more recent philosophical tradition makes of Descartes what it will. But in another sense Descartes must speak to us because he was on to something. Even if one does not find force in the reasons Descartes gave for accepting his project of natural science, his conception of the project was nonetheless efficacious. His vision of a unified celestial and terrestrial physics that emphasized spatiotemporal properties planted seeds for the development of modern physical thought that bore fruit in Newton. Moreover, Descartes stands at the beginning of modern philosophical investigation into the relation between the knower and the known. Even if we no longer are taken with his foundationalist enterprise, his epistemic individualism, or his account of cognitive faculties, the problematic of characterizing the contribution of the knower (or community of knowers) to the very constitution (or fabrication) of knowledge remains. Not only does the tradition make what it will of Descartes; Descartes has made the tradition.

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I have benefited from the opportunity to read this paper before the Royal Institute of Philosophy Conference on Philosophy and Its History (Lancaster, 1983), the Philosophy Club of Wellesley College, and the Department of the History of Science of Harvard University. I am also grateful to many other colleagues for helpful discussion, among whom I would like especially to thank Owen Hannaway, Hannah Ginsborg, John Carriero, and Wilda Anderson. This paper is an abbreviated version of "The Senses and the Fleshless Eye: The Meditations *as Cognitive Exercises," forthcoming in* Essays on Descartes' Meditations, *edited by Amelie O. Rorty and published by the University of California Press.*

1. L. J. Beck, in *The Metaphysics of Descartes* (Oxford: Clarendon Press, 1965), discussed the connection between the *Meditations* and Ignatius of Loyola's *Spiritual Exercises.* More recent discussions include Amelie O. Rorty, "Experiments in Philosophic Genre: Descartes' *Meditations,*" *Critical Inquiry* 9 (1983): 545–64, and Jonathan Rée, "Descartes's Comedy," PHILOSOPHY AND LITERATURE 8 (1984): 151–66.

2. On this, see Arthur C. Danto, "Philosophy as/and/of Literature," *Proceedings and Addresses of the American Philosophical Association* 58 (1984): 5–20.

3. The following abbreviations are used to give page references in the text: A&G, *Descartes: Philosophical Writings,* trans. Elizabeth Anscombe and P. T. Geach (Indianapolis: Bobbs-Merrill, 1971); H&R, *Philosophical Works of Descartes,* trans. E. S. Haldane and G. R. T. Ross (Cambridge: Cambridge University Press, 1934), volume I or II; K, *Descartes: Philosophical Letters,* trans. Anthony Kenny (Oxford: Clarendon Press, 1970; reprinted, Minneapolis: University of Minnesota Press, 1981).

4. My discussion of meditative literature and traditions is chiefly based upon Ignatius of Loyola, *The Spiritual Exercises,* 4th ed., trans. W. H. Longridge (London: Mowbray, 1950), Eustace of St. Paul, *Exercices Spirituels* (Paris, 1630; 2nd ed., 1640), Francis de Sales, *An Introduction to the Devoute Life,* trans. J. Yakesley (Douai, 1613), and Adolphe Tanquerey, *The Spiritual Life,* trans. H. Brandeis (Westminster, Maryland: Newman, 1948).

5. *Summa Theologica,* Pt. II, Second Part, Qu. 82, Art. 3.

6. All references in this paragraph are to Augustine, *Confessions,* trans. A. C. Outler (Philadelphia: Westminster, 1955), by book and section.

7. Thomas Aquinas, *Summa Theologica,* Part I, Qu. 12, Arts. 11–12; Qu. 84, Art. 7; Qu. 85, Art. 1. Here I contrast Descartes's position with an Aristotelian position, which of course, need not have been Aristotle's position (though, as in the present case, it may have textual support in Aristotle – see *De Anima,* Bk. III, chap. 4, 429a18–29, and chap. 8, 432a3–14). The Aristotelian position sketched constitutes a common medieval and seventeenth-century interpretation of Aristotle, via Thomas.

8. Francisque Cyrille Bouillier, *Histoire et critique de la révolution cartésienne* (Lyon, 1842), pp. 380–86, quotation from p. 380.

9. Descartes's doctrine that mathematical objects are known by the intellect independently of the imagination is clearly stated in the Sixth Meditation (A&G, pp. 109–10; see also A&G, pp. 72–73); on the development of Descartes's mathematical thought beyond the imagination-based account of the *Regulae,* see John A. Schuster, *Descartes and the Scientific Revolution, 1618–1634* (Ann Arbor: University Microfilms, 1977), chap. 6.

[7]

What is Cartesian Doubt?

by Nicholas Wolterstorff

John Locke, after distinguishing sharply between knowledge, on the one hand, and belief (opinion, assent) on the other, proceeded to offer a general ethic for the governance of our belief. "Reason must be our last judge and guide in everything," he said (*Essay* IV, xix, 14). Or more helpfully: assent, "if it be regulated, as is our duty, cannot be afforded to any thing, but upon good reason. . . . For he governs his assent right, and places it as he should, who in any case or matter whatsoever, believes or disbelieves, according as reason directs him" (IV, xvii, 24).

That there is a general ethic of belief and that the responsible believer is the rational believer, one whose beliefs are all held for good reasons—once these convictions had been clearly formulated and persuasively propounded by Locke they became a prominent part in the mentality of modernity, not always embraced, often in fact contested, but never put out of mind. Not yet, anyway.

What I have just said will evoke from many the rejoinder: It is not Locke but Descartes who first articulated with clarity and cogency this vision of the believer as responsible, and of the responsible believer as the rational believer. I propose in what follows to argue the case that Descartes was not, on this matter, the originator. On this matter Descartes marked the end of the medieval mentality more than the beginning of the modern—though on other matters Descartes was modern indeed. My topic, then, is an issue of intellectual paternity. But I shall devote almost all the defense of my thesis to offering an interpretation of Descartes which pivots on an understanding of Cartesian doubt.

My contention is that Descartes offered no general ethic for the governance of belief (opinion). At most he offered rules of thumb, and these of restricted scope. Further, the rules of thumb he offered did not appeal to the deliverances of Reason, not to believing for reasons. In several of them he instead suggested that one conform oneself to the traditions and practices of the people among whom one happens to live—not something that Locke ever recommended! Far more prominent in Descartes' thought and writing than his rules for the governance

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of opinion was his Method. But the Method, so I shall contend, was not a rule for the governance of opinion but for the construction of *scientia*. Descartes took over intact the traditional medieval tripartite scheme of knowledge, faith, and opinion, offering no substantial innovation in how these are to be understood. And his attention fell almost entirely on that species of knowledge which is *scientia*.

On these matters, too, Locke was the first great modern. Locke discarded the tripartite scheme by treating faith as a species of belief (opinion). Then, convinced that *scientia* could never amount to much, he paid it little attention. He offered no method, no rule, for its construction. Instead he recommended that we systematically pursue the new project which he called "natural philosophy." But natural philosophy, in his view, yields belief, not knowledge. It is not a form of *scientia*.

Before we set out to interpret Descartes, I must raise a hermeneutical issue. Central to my interpretation will be a proposal as to the nature of Cartesian doubt. It would be easy, however, to cite passages in which Descartes speaks about doubt with words whose "plain sense" does not fit my interpretation. It is from that "plain sense" that others have developed their different understandings of Cartesian doubt. So what leads me to violate that "plain sense"? Two considerations. I do not see how the "plain sense" interpretation can be fitted into an overall interpretation of Descartes which makes sense of his total project; and I propose that we prefer the interpretation which does make sense of his overall project to the one which does not. Secondly, and much more importantly, I propose that we follow Descartes' own guidelines as to the interpretation of such passages. In his letters, and especially in his replies to the objections to the *Meditations*, Descartes repeatedly calls attention to certain indications he has planted in the text as to the nature of his general project; and he insists that these indications be treated as guidelines in interpreting his text. It turns out that following those guidelines often requires that we not go by the "plain sense" of the text. Descartes regularly accuses his critics of ignoring the guidelines and—though he would not put it this way—going instead by the "plain sense." I propose that we in our interpretation do follow Descartes' own guidelines; I think it would be perverse not to do so. Of course the trouble arises from the fact that though Descartes wishes his text to be interpreted in accord with his guidelines, he himself seems to have composed a good deal of it without having those guidelines clearly in mind.

Descartes entitled his *Discourse*, *Discourse on the method of rightly conducting his reason and searching the truth in the sciences* [*scientiae*].[1]

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[1] All my citations of Descartes' writings will be from *The Philosophical Writings of Descartes*, the first two volumes edited by Cottingham, Stoothoff, & Murdoch

Along the same line, Rule Three of his earlier but unpublished *Rules for the Direction of the Mind* reads as follows:

> Concerning objects proposed for study, we ought to investigate what we can clearly and evidently intuit or deduce with certainty, and not what other people have thought or what we ourselves conjecture. For knowledge (*scientia*) can be attained in no other way (CSM I:13).

Again, the *Meditations* open with the words,

> Some years ago I was struck by the large number of falsehoods that I had accepted as true in my childhood, and by the highly doubtful nature of the whole edifice that I had subsequently based on them. I realized that it was necessary, once in the course of my life, to demolish everything completely and start again right from the foundations if I wanted to establish anything at all in the sciences (*scientiae*) that was stable and likely to last (CSM II:12).

And in his late unpublished dialogue, *The Search for the Truth*, Descartes has his spokesman in the dialogue, Eudoxus, say at one point:

> I confess that it would be dangerous for someone who does not know a ford to venture across it without a guide, and many have lost their lives in doing so. But you have nothing to fear if you follow me. Indeed, just such fears have prevented most men of letters from acquiring a body of knowledge which was firm and certain enough to deserve the name 'science' (*scientia*) (CSM II:408).

I suggest that, throughout his career, Descartes had his eye on the construction of *scientia*. His Method was a method for the construction of that and of that alone.

Furthermore, with a qualification to be introduced shortly, Descartes took *scientia* to be what the high medievals (and Aristotle) took it to be—and what Locke still took it to be. The fundamental criterion is certitude: What is truly *scientia* will have certitude. "No act of awareness (*cognitio*) that can be rendered doubtful seems fit to be called knowledge (*scientia*)" says Descartes in his reply to the second set of objections to the *Meditations* (CSM II:103). In his discussion of Rule

(Cambridge: Cambridge University Press, 1984 and 1985) [henceforth CSM], and the third volume, consisting of passages from Descartes' letters, translated by Cottingham, Stoothoff, Murdoch, & Kenny (1991) [henceforth CSMK].

Two in *Rules for the Direction of the Mind* he says that "all knowledge (*scientia*) is certain and evident cognition" (CSM I:10). And in his discussion of Rule Three he speaks of what is desired as "so evident and certain as to be beyond dispute," "a knowledge of things with no means of being mistaken" (CSM I:14). Descartes' line of thought requires, as we shall see, that he be interpreted as usually having in mind by certainty not a certain firmness of assent to propositions but a certain degree of truth-likelihood in one's mode of apprehending propositions—the highest degree.

Descartes appears throughout his career to have thought of the certain as having two marks. It is incorrigible: "no means of being mistaken." And it is indubitable. A mode of apprehending a proposition is indubitable just in case a person could never, when apprehending the proposition in that mode, have a good enough reason for doubting it—i.e., for refraining from believing it.[2] (Shortly I shall call this *rational indubitability*, to distinguish it from another type.) *Scientia* is to be built up from apprehensions which are incorrigible and indubitable.

As to "the actions of the intellect by means of which we are able to arrive at a knowledge of things with no fear of being mistaken: We recognize only two: intuition and deduction" (CSM I:14). This is Descartes' claim in his early *Rules*. I see no evidence that he ever changed his mind on this; the only change is that in his later writings he speaks of "the natural light" rather than of intuition. Both intuition and deduction—here too Descartes is at one with the medievals before him and with Locke after him—are thought of fundamentally as perception, awareness, apprehension. The word *intueri* itself suggests this.

What is it that characterizes those modes of apprehension of propositions in which intuition and deduction are at work—thus, those modes fit to lay at the foundation of *scientia*? Certainty, of course, marked by indubitability and incorrigibility. But is there anything phenomenological or quasi-phenomenological about the state? Yes, indeed. When we apprehend a proposition clearly and distinctly, then intuition is at work.[3] Intuition, says Descartes, is "the conception of a clear and attentive mind, which is so easy and distinct that there can be no room for doubt about what we are understanding. Alternatively, and this comes to the same thing, "intuition is the indubitable conception of a clear and attentive mind which proceeds solely from the light of reason" (CSM I:14). As examples of propositions which can be intuited, Descartes says that "everyone can mentally intuit that he exists, that he is thinking, that a triangle is bounded by just three lines, and a sphere by a single surface, and the like." And for those who grant that there are such perceptions but doubt that a *scientia* built up from them will come to very much, Descartes adds: "Perceptions such as these are more numerous than most people realize, disdaining as they do to turn their minds to such simple matters" (CSM I:14).

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[2] Cf. Harry G. Frankfurt, *Demons, Dreamers, and Madmen* (New York: The Bobbs-Merrill, 1970), p. 27.

[3] Harry Frankfurt's book, (ibid.,) remains in my judgment much the best book on Descartes. From amidst the vast literature on Descartes, I shall especially pay to it the honor of expressing agreement and disagreement. On pp.123ff. of his book, Frankfurt suggests that Descartes in speaking of clear and distinct perception was not trying to pick out a certain phenomenology; rather, the concept of clear and distinct perception, says Frankfurt, just is the concept of entertaining a proposition in a way such that it is indubitable for one. Though this suggestion has some attractive features, it seems to me that certain texts are decisively against it. For example, when Descartes explains what he has in mind by clear and distinct perception in *Principles* I:43-46, he uses very

Descartes' explanation of deduction in the *Rules* is parasitic on that of intuition:

> The self-evidence and certainty of intuition is required not only for apprehending single propositions, but also for any train of reasoning whatever. Take for example the inference that 2 plus 2 equals 3 plus 1; not only must we intuitively perceive that 2 plus 2 make 4, and that 3 plus 1 make 4, but also that the original proposition follows necessarily from the other two. There may be some doubt here about our reason for suggesting another mode of knowing in addition to intuition, viz., deduction, by which we mean the inference of something as following necessarily from some other propositions which are known with certainty. But this distinction had to be made, since very many facts which are not self-evident are known with certainty, provided they are inferred from true and known principles through a continuous and uninterrupted movement of thought in which each individual proposition is clearly intuited. . . . Hence we are distinguishing mental intuition from certain deduction on the grounds that we are aware of a movement or a sort of sequence in the latter but not in the former, and also because immediate self-evidence is not required for deduction, as it is for intuition; deduction in a sense gets its certainty from memory. It follows that those propositions which are immediately inferred from first principles can be said to be known in one respect through intuition, and in another through deduction.

phenomenological language. Here is one example: "I call a perception 'clear' when it is present and accessible to the attentive mind" (CSM I:207). Further, it seems to me that regarding the concepts as identical renders unintelligible the "so . . . that" of Rule One in the *Discourse*: "to include nothing more in my judgment than what presented itself to my mind so clearly and so distinctly that I had no occasion to doubt it" (CSM I:120).

> But the first principles themselves are known only through intuition, and the remote conclusions only through deduction (CSM I:14-15).

What Descartes called The Method, from the time of the *Discourse* onwards, consists then of a rule for constructing *scientia*, that is to say, a rule for arriving at a body of propositions each of which has been intuited, or deduced from what has been intuited.[4]

The faculty of intuition is at work in the clear and distinct apprehension of propositions—so we have found Descartes insisting. But are there not degrees of this, someone might ask—degrees of clarity and distinctness of apprehension? Perhaps so, says Descartes. But then we can add this: A law pertaining to the working of the human mind is that when our perception of a proposition attains a certain high degree of clarity and distinctness, then it is simply impossible to refrain from believing it. Over and over Descartes affirms this law: "my nature is such that so long as I perceive something very clearly and distinctly I cannot but believe it to be true" (CSM II:48). "All of us have been so moulded by nature that whenever we perceive something clearly, we spontaneously give our assent to it and are quite unable to doubt its truth" (CSM I:207).[5] When this law—let us call it the Law of Assent—when this law of the mind comes into operation, then our faculty of intuition is at work.

Repeatedly Descartes makes clear that in *scientia* there is no room for appeal to tradition or authority. In this, too, he is at one with the medievals; as he is in what he sees as the point, the benefit, of the pursuit of *scientia*: "human beings, whose most important part is the mind, should devote their main efforts to the search for wisdom, which is the true food of the mind" (Preface to the French edition of *The Principles*: CSM I:180). Descartes begins to depart from the classic medievals, however, when he raises the question: How do we free ourselves from prior judgments about certainty, judgments acquired from tradition and experience, so as to be able to construct a *scientia* of pure intuition and deduction—a body of certitude? Though a high medieval like Aquinas did not neglect this question, what he said on the matter was very different from what Descartes proposed. Descartes' strategy for freeing the mind contributed crucially to giving his thought its "Cartesian" character.

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[4] The high medievals would have said that *scientia* proper consists only of propositions deduced from propositions intuited, and does not include those intuited. Though here and there it appears that Descartes follows this usage, the "appearances" are not very decisive, and Descartes never, to my knowledge, emphasizes the point. So I have chosen to speak as if Descartes would also include, within *scientia*, propositions intuited. For a good discussion of Descartes' understanding of *scientia*, see Daniel Garber, "Science and Certainty in Descartes" in Michael Hooker (ed.), *Descartes: Critical and Interpretive Essays* (Baltimore: Johns Hopkins University Press, 1978), pp. 114-15.

[5] One of the most interesting affirmations of the Law of Assent occurs in Descartes' reply to the second set of objections to the *Meditations* (CSM II:104): "some of these perceptions are so transparently clear and at the same time so simple that we cannot ever think of them without believing them to be true. The fact that I exist so long as I am thinking, or that what is done cannot be undone, are examples of truths in respect of which we manifestly possess this kind of certainty. For we cannot doubt them unless we think of them; but we cannot think of them without at the same time believing they are true, as was supposed. Hence we cannot doubt them without at the same time believing they are true; that is, we can never doubt them."

In the early *Rules*, Descartes says that

> We ought to read the writings of the ancients, for it is of great advantage to be able to make use of the labours of so many men. . . . But at the same time there is a considerable danger that if we study these works too closely traces of their errors will infect us and cling to us against our will and despite our precautions (CSM I:13).

And in the *Principles* he says that

> Since we began life as infants, and made various judgments concerning the things that can be perceived by the senses before we had the full use of our reason, there are many preconceived opinions (*praejudicia*) that keep us from knowledge of the truth (I,i CSM I:193).

We need to be cured of the disease of approaching the enterprise of *scientia* with mistaken preconceptions as to the locus of certitude. In his reply to Gassendi's objections to the *Meditations*, Descartes emphasized the difficulty of the cure (CSM I: 241-2).

The therapy Descartes recommends is what I shall call The Discipline of Doubt. Here is one of Descartes' well known recommendations of it:

> In order to philosophize seriously and search out the truth about all the things that are capable of being known, we must first of all lay aside all our preconceived opinions, or at least we must take the greatest care not to put our trust in any of the opinions accepted by us in the past until we have first scrutinized them afresh and confirmed their truth. Next, we must give our attention in an orderly way to the notions that we have within us, and we must judge to be true all and only

> those whose truth we clearly and distinctly recognize when we attend to them in this way (*Principles* I,75, CSM I:221).

The language Descartes uses in this passage suggests that, as he sees it, The Discipline of Doubt is not The Method itself but a therapeutic discipline to be undertaken if one wishes to use The Method satisfactorily.[6] (Cf. CSM II:270, last para.; and CSM II:324.) In other passages Descartes speaks as if, in his eyes, The Discipline and The Method were identical (see esp. CSM II:407). In fact I think that a coherent interpretation of Descartes requires that we view them as distinct, and I shall henceforth treat them thus. Perhaps the most decisive reason is this: if we are apprehending, say, certain mathematical propositions clearly and distinctly, The Method tells us that we are allowed to accept them, whereas The Discipline instructs us to doubt them.

History displays that Descartes invites being interpreted as holding that the goal of The Discipline is to free the mind from all, or almost all, assent—to vacuum the mind. I shall argue that that is not what Descartes thinks necessary for practicing *scientia* successfully; indeed, he thinks such a goal could never be achieved.

How are we to be liberated from our obstructive *praejudicia*? Descartes gives many descriptions of The Discipline of Doubt. Here is one from the beginning of the *Principles*: "It seems that the only way of freeing ourselves from these opinions is to make the effort, once in the course of our life, to doubt everything which we find to contain even the smallest suspicion of uncertainty." And then, adding what already his original readers thought to be overkill, Descartes says: "Indeed, it will even prove useful, once we have doubted these things, to consider them as false, so that our discovery of what is most certain and easy to know may be all the clearer" (CSM I:193).

As the first step in The Discipline of Doubt, Descartes says that

> our initial doubts will be about the existence of the objects of sense-perception and imagination. The first reason for such doubt is that from time to time we have caught out the senses when they were in error, and it is prudent never to place too much trust in those who have deceived us even once. The second reason is that in our sleep we regularly seem to have sensory perception of, or to imagine, countless things which do not exist anywhere; and if our doubts are on the scale just outlined, there seem to be no marks by means of which we

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[6] Though I do not entirely agree with his understanding of the character and role of intellectual therapy in Descartes' thought, someone who has seen the importance of its role, especially in the *Meditations*, is Mike Marlies, "Doubt, Reason, and Cartesian Therapy" in Michael Hooker, *Descartes*, pp. 89-113.

> can with certainty distinguish being asleep from being awake (CSM I:193-4).

Yet in the Synopsis to the *Meditations*, Descartes says about the arguments offered in Meditation VI for "the existence of material things" that "the great benefit of these arguments is not, in my view, that they prove what they establish—namely that there really is a world, and that human beings have bodies and so on—since no sane person has ever seriously doubted these things" (CSM II:11). And in his reply to Gassendi's objections to the *Meditations* he repeats the point: "Hence I point out in one passage that no sane person ever seriously doubts such things" (CSM II:243).

What are we to make of this? As the first step in The Discipline of Doubt, we are to doubt the testimony of our senses that there is a material world. And of course Descartes suggests that he himself, a sane person, has done this. Yet he also asserts emphatically that no sane person has ever seriously doubted these things. Unless we attribute the most appalling confusion to Descartes, we must interpret him as having two different things in mind by "doubt."

We can get at the same issue from a somewhat different angle. To engage in The Discipline of Doubt, let us remind ourselves, "is to make the effort, once in the course of our life, to doubt everything which we find to contain even the smallest suspicion of uncertainty." It consists of

> rejecting everything in which I could discover the least occasion for doubt; for it is certain that principles which it was impossible to reject in this way, when one attentively considered them, are the clearest and most evident that the human mind can know (CSM I:183).

But in his replies to the second set of objections to the *Meditations*, Descartes says that

> I should like you to remember here that, in matters which may be embraced by the will, I made a very careful distinction between the conduct of life and the contemplation of the truth. As far as the conduct of life is concerned, I am very far from thinking that we should assent only to what is clearly perceived. On the contrary, I do not think that we should always wait even for probable truths . . . (CSM II:106).

But of course we cannot divide up propositions into two disjunct sets, those necessary for the conduct of life and those relevant to the contemplation of truth. The very propositions which for the contemplation of truth we must doubt, for the conduct of life we must believe. We cannot even think of doubting and not doubting such propositions as things to be done sequentially, since while a person is engaged in the contemplation of truth he is also engaged in the conduct of life. While doubting that there is anything solid, as part of his contemplation of truth, a person must believe that he is seated on something solid. The conduct of life is not something that one leaves to contemplate truth. It embraces one's contemplation of truth.

Perhaps if we try to recover what Descartes' experience would have been as he engaged in The Discipline of Doubt, we can discern what his meaning is. Descartes is preparing himself to practice The Method. To do this he tries to get clear on what is certain for him, and, correspondingly, on what is not certain. So he asks himself: These beliefs of mine, to the effect that there is this and that material object, beliefs which have arisen in me by the workings of perception—do these have the requisite status of certitude? His answer is: No, they do not. Though up to this time he may well have taken them as certain, that would have been a false *praejudicium*; reflection shows that they are not indubitable. But drawing this conclusion does not remove these beliefs from Descartes. He still has them. What it does is make him doubt that they have the status requisite for *scientia*. It makes him doubt that they are certain. It removes the contrary *praejudicium*.[7]

I suggest that it is exactly this doubt which figures in The Discipline. Cartesian doubt is indeed suspension of assent. But to "doubt" P, as part of The Discipline of Doubt, is not to suspend one's belief that P but rather to suspend one's belief that one's mode of apprehending P is satisfactory for *scientia*. It is to suspend one's belief that P is certain for one. Cartesian doubt is a kind of second-order doubt: meta-doubt. It is not doubting those beliefs that play a role in the conduct of life; neither is it doubting those beliefs that play a role in the practice of religion. It is not even suspending any second-order beliefs one might have about the satisfactoriness of those beliefs for the conduct of life or for the practice of religion. Nonetheless it does involve Cartesianly doubting all the propositions that occur in the conduct of life and the practice of religion—doubting that one's mode of apprehending them is satisfactory for *scientia*, doubting that one's mode of apprehending them is the product of intuition and/or deduction. To say it again: "Doubting" a proposition, when engaging in The Discipline, is not withholding assent from it but withholding assent from the proposition that one's mode of apprehending it has the certainty required for *scientia*, the certainty whose marks are indubitability and incorrigibility. Descartes never gives up his belief that there is an external world; neither, contrary to the great majority of his interpreters, does he think that he or anyone should give it up. In fact he thinks that not having that belief would be a mark of insanity. The "greatest benefit" of "such extensive doubt" says Descartes, "lies in freeing us from all our preconceived opinions (*praejudicia*), and providing the easiest route by which the mind may be led away from the senses" (Synopsis of the *Meditations*, CSM II:9).

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[7] Frankfurt puts the point clearly, though I think that in his overall interpretation he does not give it the determining role that it ought to have "Descartes does not propose to make himself into a tabula rasa, and the skepticism to which he commits himself is innocuously thin and undisruptive. Indeed it is inappropriate to describe it as skepticism at all. Consider the example of a mathematician who is, let us say, attempting to construct a system of arithmetic. If he has so far failed or neglected to establish that '2+2=4' is a theorem of his system, he will quite properly refuse to assume in his inquiry that the equation is true. This is hardly a case of skepticism, and it would be inane to argue, as it has been argued occasionally against Descartes, that the mathematician's refusal is insincere or that his project is absurd because it is psychologically impossible for him to cease believing that 2+2=4. The mathematician continues, of course, to 'believe' the equation, but he does not accord it a place in the system he is developing because it has not yet passed the tests for inclusion. Within the context of his theoretical work in arithmetic, then, he does not yet 'believe' that 2+2=4. When he undertook his work he 'overthrew' all such beliefs in the limited sense that he decided not to take their theoretical credentials for granted." *Demons*, pp. 16-17.

And now to move from The Discipline to The Method. The Method is not to be interpreted as telling us to dissent from everything not the result of intuition and deduction. We cannot do that, says Descartes, nor should we try. The Method is rather a method for the acquisition of apprehensions which are purely the product of intuition and deduction; it is a method for the building up of true *scientia*. But since confusions, as to which of one's apprehensions are certain for one, will get in the way of satisfactory practice of The Method, the therapy of The Discipline is to be undertaken so as to clear away those confusions.

The claim has often been made that it is not clear in the *Meditations* whether Descartes means to apply his therapeutic doubt even to the clear and distinct apprehension of propositions. Certainly to confused apprehensions. But what about our apprehensions of simple mathematical propositions which are so clear and distinct that we cannot refrain from believing the propositions, and such that we cannot be in a situation where, while apprehending those propositions thus, we yet have good reason for doubting them? Is there any reason for Cartesianly doubting that such apprehensions are good enough for *scientia*? And let it be noted that Cartesian doubt can only be accomplished for reasons.

If one were to have a good reason for Cartesianly doubting propositions thus apprehended, it would have to be a reason for refraining from believing that such apprehensions are incorrigible. For we are now past the point of dubitability. If one apprehends a proposition clearly and distinctly, then one's situation could not be that of having good reason to refrain from believing it. "Whatever is revealed to me by the natural light . . . cannot in any way be open to doubt. This is because there cannot be another faculty both as trustworthy as the natural light and also capable of showing me that such things are not true" (*Meditations* III, CSM II:27). "In the case of our clearest and most careful judgments . . ., if such judgments were false they could not be corrected by any clearer judgments or by means of any other natural faculty" (Second Replies; CSM II:102-3). Of course Descartes is assuming here that by the natural light we can never intuit or demonstrate both a proposition and its contradictory. If that could happen, then one could be in a situation where one both apprehended a proposition clearly and distinctly and had good reason to refrain from believing it (not, of course, to believe its contradictory). Still this question arises: might an apprehension which is rationally indubitable nonetheless be an apprehension of a proposition which is false?

The scenario of the evil genius is designed to show that this could be, so far as one can tell at this point. (Descartes offers other, less attention-getting, scenarios for the same possibility.) If it is logically possible that there is such an evil genius, then it is logically possible that the rationally indubitable be false. And as long as we do not find it indubitable that such an evil genius is logically impossible, just so long is it not rationally indubitable for us that the rationally indubitable is incorrigible, and so, of course, not rationally indubitable that the rationally indubitable is certain. Just as granting the demon hypothesis alters nothing in the circumstances of rational dubitability/indubitability, so also it alters nothing in those of psychological dubitability/indubitability. Thus it is that Descartes exclaims in Meditation III:

> when I turn to the things themselves which I think I perceive very clearly, I am so convinced by them that I spontaneously declare: let whoever can do so deceive me, he will never bring it about that I am nothing, so long as I continue to think I am something; or make it true at some future time that I have never existed, since it is now true that I exist; or bring it about that two and three added together are more or less than five, or anything of this kind in which I see a manifest contradiction (CSM II:25).

Whether or not the *Meditations* are unclear as to how far Descartes wishes to press the question of incorrigibility, *Principles* (I, 5) is entirely clear on the matter: He wishes to press it for clear and distinct apprehensions which compel belief—thus for those apprehensions which are rationally and psychologically indubitable. The fact that my perception of a proposition is so clear and distinct that I cannot refrain from believing it and can have no good reason for doubting it while thus apprehending it, is apparently compatible with the falsehood of the proposition thus apprehended. We can imagine a scenario according to which this is how things would be. Hence we should at this point in our reflections Cartesianly doubt such propositions thus apprehended, i.e., refrain from believing that those apprehensions are certain, refrain from believing that they are satisfactory for the construction of *scientia*. For certainty, remember, requires incorrigibility as well as indubitability.

> Our doubt will also apply to other matters which we previously regarded as most certain—even the demonstrations of mathematics and even the principles which we hitherto considered to be self-evident. One reason for this is that we have sometimes seen people make mistakes in such matters, and accept as most certain and self-evident things which seemed false to us. Secondly, and most importantly, we have been told that there is an omnipotent God who created us. Now we do not know whether he may have wished to make us beings of the sort who are always deceived even in those matters which seem to us supremely evident; for such constant deception seems no less a possibility than the occasional deception which, as we have noticed on previous occasions, does occur. We may of course suppose that our existence derives not from a supremely powerful God but either from ourselves or from some other source; but in that case, the less powerful we make the author of our coming into being, the more likely it will be that we are so imperfect as to be deceived all the time (CSM I:194).[8]

Descartes rightly says that the second possibility raised is more important than the first. We do indeed make mistakes in what we take to be self-evident. But someone might insist that such mistakes can always be explained as the result of insufficient attentiveness to one's mental life, taking ourselves to have clear and distinct apprehensions when we do not. The second possibility is the truly serious one. So far as one can tell at this point, it seems quite possible that there would be something in our constitution, or some outside agent, bringing it about that we actually experience the phenomenology of intuition and deduction with respect to false propositions.

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[8] It is passages such as this which persuade me that Descartes' concept of certainty cannot be explicated entirely in terms of indubitability; incorrigibility is also necessary for certainty. For neither here nor anywhere else does Descartes suggest that he has reason to refrain from believing that clear and distinct apprehensions are indubitable; what he suggests is that, at this stage in his reflections, he has reason to refrain from believing that they are incorrigible—hence, reason to refrain from believing that they are certain.

But now the Discipline of Doubt, introduced as therapeutic training for engaging in The Method satisfactorily, threatens The Method itself—or strictly, the assumptions underlying The Method. For The Method tells us that if we are apprehending a proposition so clearly and distinctly that we cannot refrain from believing it, and more importantly, so clearly and distinctly that we could not have a good reason for doubting it while thus apprehending it—if our apprehension has psychological, but more importantly rational indubitability—then it can be regarded as satisfactory for *scientia*. Then it is to be taken as certain. But now we have discovered that we, at this point in our reflections, have good reason to doubt whether this is correct. For even though such apprehensions be indubitable in both senses, we have good reason to doubt that they are necessarily also incorrigible. But if not incorrigible, then not certain. Thus at this point in the argument we have good reason to refrain from believing that following The Method will yield *scientia*.

And if we do not know whether The Method yields *scientia*, then it does not yield *scientia*. This shows, of course, how Descartes understands the nature of *scientia*. Nothing has been said to show that indubitability does not coincide with incorrigibility. For all we know at this point, a systematic pursuit of indubitability might in fact yield believings which are also incorrigible—hence fully certain. But we would still not have *scientia*.

> The fact that an atheist can be 'clearly aware that the 3 angles of a triangle are equal to 2 right angles' is something I do not dispute. But I maintain that this awareness (*cognitio*) of his is not true knowledge (*scientia*), since no act of awareness (*cognitio*) that can be rendered doubtful seems fit to be called knowledge (*scientia*) (SCM II:101).

So how are we to proceed? We have to overcome this doubt that indubitable apprehensions are incorrigible apprehensions—this reason-grounded refraining from believing that apprehensions so clear and distinct that they are psychologically and rationally indubitable are also incorrigible. That is what Descartes proceeds to try to do. Of course he cannot assume along the way that indubitable apprehensions are always true. All that he has to go on is indubitability itself. I suggest, in short, that what Descartes tries to do at this point is construct an argument which satisfies these two conditions:

> (1) It has for its conclusion that apprehensions of propositions so clear and distinct as to be rationally (and also psychologically) indubitable are necessarily also true, i.e., incorrigible;
>
> and
>
> (2) Its premisses, and the proposition that the premisses entail the conclusion, are apprehended so clearly and distinctly as to be rationally (and psychologically) indubitable.

Supposing that an argument which satisfies these conditions can be found, its import remains to be clarified. But counter to the charges which have haunted Descartes' *Meditations* ever since their publication, there is nothing circular or question-begging either in the argument proper or in Descartes' strategy as a whole. When clearly and distinctly focussing on the argument presented, the conclusion that clarity and distinctness of apprehension insures truth of the proposition apprehended is for one both rationally and psychologically indubitable: Descartes claims to have given an argument of that sort. His failure lies simply in the fact that his argument is not of that sort. It is not indubitable; it does not satisfy the second condition above. Almost no one has thought that it does, other than Descartes himself.

Of course no one can keep the argument in mind all the time. So suppose that now I just remember that I could not refrain from accepting its conclusion. Can I now refrain once again from accepting its conclusion? Can I now refrain from believing that clarity and distinctness of apprehension of a proposition (and compelled assent thereto) is a guarantee of the truth of the proposition? Can I now, once again, "doubt" propositions which I know that I have entertained with the phenomenology of clarity and distinctness and of compelled assent? Descartes thinks that if one remembers the central role in the argument of an omnipotent, omniscient, and benevolent God, one cannot do this: "as soon as I turn my mind's eye away from the proof, then in spite of still remembering that I perceived it very clearly, I can easily fall into doubt about its truth, if I am without knowledge of God" (CSM II:48).

Previously we sketched a scenario according to which we could have the phenomenology of clarity and distinctness (and compelled assent) with respect to falsehoods. It was the scenario of the powerful demon. The scenario did not enable us to refrain from believing any specific proposition when apprehending it clearly and distinctly. But it did enable us, when standing back from such apprehensions, to doubt whether such apprehensions are always and necessarily true. But now we are in the position of not being able to believe that scenario; we can only believe that it is impossible. We cannot believe that there can be such a demon—for we are rationally and psychologically compelled to believe that there is an omnibenevolent, omniscient, omnipotent God who exists necessarily; and that necessarily God will prevent any such demon's doings. Only if there were no necessarily existing God of this sort would a demon of the sort imagined be possible. Furthermore, given our compelled assent to the existence of God, Descartes thinks that no other scenario is available which would lead us to withhold assent from the general proposition that clarity and distinctness of apprehensions of propositions guarantees truth. The only way to do that now would be to forget what we have established concerning God.

> Even if I am no longer attending to the arguments which led me to judge that this is true, as long as I remember that I clearly and distinctly perceived it, there are no counter-arguments which can be adduced to make me doubt it, but on the contrary I have true and certain knowledge of it. And I have knowledge not just of this matter, but of all matters which I remember ever having demonstrated, in geometry, and so on. For what objections can now be raised? (CSM II:48)[9]

I have emphasized Descartes' introduction of The Discipline of Doubt as a strategy for getting rid of the mistaken *praejudicia* that hinder us in the practice of *scientia*—*praejudicia*, once again, being views as to which of our apprehensions are certain. Pretty clearly, though, Descartes saw The Discipline, when combined with the *Meditations* argument, as serving another purpose as well, namely, the polemical purpose of beating the sceptic at his own game. Descartes entertains the most radical scepticism; and then, as he sees it, brings himself and his readers to the point where neither rationally nor psychologically can they believe this scepticism. More than that, the *Meditations* argument, following on the radical practice of The Discipline, plays the constructive role of making it indubitable that The Method is satisfactory for the construction of *scientia*. In that way, it "establishes" the foundations of *scientia*. (Of course, the *Meditations* argument itself satisfies, formally, at least the first of the rules for The Method offered in the *Discourse*.)

[9] Cf. Reply to the Second Set of Objections to the *Meditations*, CSM II:104: "But we forget the arguments in question and later remember simply the conclusions which were deduced from them. The question will now arise as to whether we possess the same firm and immutable conviction concerning these conclusions, when we simply recollect that they were previously deduced from quite evident principles (our ability to call them 'conclusions' presupposes such a recollection). My reply is that the required certainty is indeed possessed by those whose knowledge of God enables them to understand that the intellectual faculty which he gave them cannot but tend towards the truth. . . ." Thus God is also a guarantor of the veracity of memory. See also Descartes' letter to Regius of 24 May 1640 (CSMK: 147).

It may be added that, in turn, Descartes saw The Method not only as the best strategy for building up *scientia* but also as yielding a "critique" of those of our assent-forming faculties other than intuition and deduction. We discover, for example, to what extent perception informs us about reality.

We must beware, though, of conceding to Descartes' strategy more significance that it actually has. In the course of the early stages of Descartes' argument in the *Meditations*, which culminates in his affirmation of the principle that the phenomenology of clarity and distinctness (and of compulsion to believe) is a guarantee of truth, Descartes observes that the *cogito ergo sum* is impervious to the wiles of the evil genius. It is impossible that one should be compelled to believe this when it is false. The indubitable is here incorrigible. Suppose

> there is a deceiver of supreme power and cunning who is deliberately and constantly deceiving me. In that case I too undoubtedly exist, if he is deceiving me; and let him deceive me as much as he can, he will never bring it about that I am nothing so long as I think that I am something (CSM II:17).

Descartes makes no such claim about later premisses in the argument. What he claims is just that if one follows the argument as a whole, then

> (1) One is rationally and psychologically compelled to believe that necessarily what one is thus compelled to believe is true.

But from this it does not follow that

> (2) Necessarily what one is thus compelled to believe is true. To get from (A) to (B) we need a (justified) principle of elimination: Compelled P—P. But Descartes' argument does nothing to entitle us to this principle. The truth is that (A) is compatible with

> (3) Sometimes what one is thus compelled to believe is false.[10]

It is indubitable for us that what we apprehend clearly and distinctly is certain. This we know. So Descartes sees himself as having accomplished what he had to accomplish: remove our doubt that clear and distinct apprehensions of propositions are certain. But what we do not know is that it is certain for us that clear and distinct apprehensions of propositions are certain. Or more precisely: though we find ourselves compelled to believe that what we are compelled to believe is true, we do not find ourselves compelled to believe that it's certain that what we are compelled to believe is true.

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[10] It was my colleague at Calvin College, Del Ratzsch, who suggested to me the precise point made in this paragraph.

Thus Descartes' argument, if it were successful, would display for us "a demand of thought"; it would not do more than that. Of all the commentators on Descartes, it is Frankfurt who has seen most clearly this "Kantian" import of the argument. Descartes' argument, he says,

> is an attempt to show that there are no good reasons for believing that reason is unreliable—that the mistrust of reason is not supported by reason and that it is accordingly irrational. . . . The point of Descartes' validation of reason is that if reason is properly employed—that is, if we give assent only to what we clearly and distinctly perceive—we are not led to doubt that reason is reliable. We are led, on the contrary, to assent to the propositions that God exists and that He guarantees the reliability of reason. . . . [N]o proposition entailing the unreliability of reason can be clearly and distinctly perceived.[11]

It might be asked, finally, whether Descartes himself ascribed to his argument the import I have just ascribed to it—somewhat limited, yet sufficient for his purposes? There is not, in my judgment, evidence that he consistently understood it thus. But that he sometimes understood the import of the argument along the lines I have suggested is, I judge, the best interpretation to be put on this passage from the Second Set of Replies:

> as soon as we think that we correctly perceive something, we are spontaneously convinced that it is true. Now if this conviction is so firm that it is impossible for us ever to have any reason for doubting what we are convinced of, then there are no further questions for us to ask: we have everything that we could reasonably want. What is it to us that someone may make out that the perception whose truth we are so firmly convinced of may appear false to God or an angel, so that it is, absolutely speaking, false? Why should this alleged 'absolute falsity' bother us, since we neither believe in it nor have even the smallest suspicion of it? . . . It is . . . no objection for someone to make out that such truths might appear false to God or to an angel. For the evident clarity of our percep-

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[11] *Demons*, pp. 175-77.

> tions does not allow us to listen to anyone who makes up this kind of story (CSM II:103-4).

My contention throughout has been that Descartes' main concern was *scientia*, or as he sometimes calls it, "the contemplation of the truth." The Method is a method for the construction of *scientia*. And what I have called The Discipline of Doubt is, first of all, a therapy to be undertaken so that we can practice The Method satisfactorily. Whereas the center of Locke's concern was to give us a rule for the regulation of *opinio*, Descartes, for *opinio*, gives us nothing more than a few limited, bland, and thoroughly conventional pieces of advice.

It would appear, however, that this interpretation is in flagrant conflict with what Descartes says in Meditation IV. For there, in the context of inquiring how error in human belief is compatible with the existence of an omnipotent, omniscient, benevolent God, Descartes says that "If . . . I simply refrain from making a judgment in cases where I do not perceive the truth with sufficient clarity and distinctness, then it is clear that I am behaving correctly and avoiding error. But if in such cases I either affirm or deny, then I am not using my free will correctly" (CSM II:41).[12] And he adds: "For it is surely no imperfection in God that he has given me the freedom to assent or not to assent in those cases where he did not endow my intellect with a clear and distinct perception; but it is undoubtedly an imperfection in me to misuse that freedom and make judgements about matters which I do not fully understand" (CSM II:42). Here Descartes nowhere indicates that his claims are restricted to *scientia*. He appears to be claiming, in general, that if one assents to some proposition which one has not perceived with full clarity and distinctness, then one is misusing the faculties God has given one.

But if this were in fact the right interpretation, Descartes would regard himself and every other sane person as violating this fundamental human obligation. For, as we have seen, he thinks that every sane person believes various existential propositions about material bodies, even though these are not apprehended clearly and distinctly. I think the proper interpretation requires that we take with full seriousness the explanations and disclaimers that Descartes makes in his reply to the second set of objections to the *Meditations.* I have already quoted part of the passage. Let me now quote the entire passage.

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[12] A bit later Descartes adds: "this indifference does not merely apply to cases where the intellect is wholly ignorant, but extends in general to every case where the intellect does not have sufficiently clear knowledge at the time when the will deliberates" (CSM II:41). Compare *Principles* I, 39: "the freedom which we experienced within us was nonetheless so great as to enable us to abstain from believing whatever was not quite certain or fully examined" (CSM I:206). And also from *Meditations* IV: "For although probable conjectures may pull me in one direction, the mere knowledge that they are simply conjectures, and not certain and indubitable reasons, is itself quite enough to push my assent the other way. My experience in the last few days confirms this: the mere fact that I found that all my previous beliefs were in some sense open to doubt was enough to turn my absolutely confident belief in their truth into the supposition that they were wholly false" (CSM II:41).

> I should like you to remember here that, in matters which may be embraced by the will, I made a very careful distinction between the conduct of life and the contemplation of the truth. As far as the conduct of life is concerned, I am very far from thinking that we should assent only to what is clearly perceived. On the contrary, I do not think that we should always wait even for probable truths; from time to time we will have to choose one of many alternatives about which we have no knowledge, and once we have made our choice, so long as no reasons against it can be produced, we must stick to it as firmly as if it had been chosen for transparently clear reasons. I explained this on p. 26 [CSM I,23] of the *Discourse on the Method.* For when we are dealing solely with the contemplation of the truth, surely no one has ever denied that we should refrain from giving assent to matters which we do not perceive with sufficient distinctness. Now in my *Meditations* I was dealing with the contemplation of the truth; the whole enterprise shows this to be the case, as well as my express declaration at the end of the First Meditation where I said that I could not possibly go too far in my distrustful attitude, since the task in hand involved not action but merely the acquisition of knowledge (CSM II:106; see also Fourth Replies, CSM II:172, and Fifth Replies, CSM II:243).

We should assent to P as satisfactory for *scientia* only if it is clearly and distinctly apprehended. But what, you ask, about our actual assent to P? Believing that P is satisfactory for *scientia* is different from believing (assenting to) P. Further, it sometimes turns out that the very proposition, assent to which is indispensable for the conduct of life, is not appropriately assented to as satisfactory for the conduct of *scientia.* Do I then, or do I not, actually assent to P? Descartes says Yes. Nonetheless his observations on the matter are seldom more than incidental. That, on my interpretation, is no accident. Descartes is simply not much interested in rules for regulating our actual assent to most propositions. He is interested in acquiring a systematic and productive body of propositions each of which we know to have been either intuited or deduced from what is intuited. Obviously such propositions will be assented to. But there are many other belief-forming faculties than intuition and deduction. Some of these others lead us to assent to propositions which later we intuit or deduce; some lead us to assent to propositions which we never do and never can intuit or deduce. In all of that, Descartes had no fundamental interest.

There is one exception which Descartes himself introduced into The Method—an exception which he seems to have regarded as minor in scope of application but major in import. Repeatedly Descartes emphasizes that not only is the Method not meant for the conduct of life; it is also not meant for religious faith: "when I asserted that 'we should assent only to what we clearly know' this was always subject to the exception of 'matters which belong to faith and the conduct of life'" (CSM II,172). When it comes to faith, the rule is that we are to accept what is revealed by God:

> if God happens to reveal to us something about himself or others which is beyond the natural reach of our mind—such as the mystery of the Incarnation or of the Trinity—we will not refuse to believe it, despite the fact that we do not clearly understand it (*Principles* I, 25; CSM I:201).

As we have seen, our natural perceptual faculties produce in us apprehensions of, and assentings to, various propositions which we have neither intuited nor demonstrated. That is quite acceptable, says Descartes. What must be kept in mind, however, is that none of those apprehensions belongs to *scientia*; any *praejudicia* we may have that these beliefs are certain must be overcome by The Discipline of Doubt. For the most part, the same is true of religious faith. Faith simply involves a different apprehension and belief-forming process from the workings of those faculties of intuition and deduction which yield *scientia*. What that process might be, Descartes tries briefly to explain in his reply to the second set of objections to the *Meditations* (CSM II:205). It is indeed a process rather than a faculty or mechanism. It consists of God directly producing in us the firm conviction, concerning some proposition P, that God has revealed it; and that, given our intuition that God cannot lie, produces in us the belief that P.[13]

But to limit the scope of The Method to the practice of *scientia* is different from allowing that, in the practice of *scientia*, we are to acknowledge exceptions to it. Descartes insists that we acknowledge exceptions; specifically, at the point where we intuit one of the items of faith as being in contradiction with some proposition which is entertained by us with the phenomenology of clarity and distinctness and compelled belief. In such a case we must, or perhaps just will, prefer the item of faith. We should or will conclude that at this point the phenomenology of clarity and distinctness and compelled belief does not guarantee truth. Our situation is that we find ourselves with the belief that God has revealed P, whereas we apprehend clearly and distinctly and are compelled to believe both not-P, and that not-P contradicts P. In such a situation, our conviction that God has revealed P, plus our standing conviction that God cannot lie, should, or will, win out over our intuitions, leading us to believe P. Hence

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[13] "Now although it is commonly said that faith concerns matters which are obscure, this refers solely to the thing or subject-matter to which our faith relates; it does not imply that the formal reason which leads us to assent to matters of faith is obscure. On the contrary, this formal reason consists in a certain inner light which comes from God, and when we are supernaturally illumined by it we are confident that what is put forward for us to believe has been revealed by God himself. And it is quite impossible for him to lie; this is more certain than any natural light, and is often even more evident because of the light of grace" (Reply to the Second Set of Objections to the *Meditations*; CSM II:105). Cf. Descartes' letter to Hyperaspistes of August 1641: "In the reply to the Second Objections I said 'enlightened by God, we trust that what is

> above all else we must impress on our memory the overriding rule that whatever God has revealed to us must be accepted as more certain than anything else. And although the light of reason may, with the utmost clarity and evidence, appear to suggest something different, we must still put our entire faith in divine authority rather than in our own judgment (*Principles* I,76; CSM I:221).

The interpretation of Descartes which I have presented is, at several points, unconventional. Nonetheless I have not tried to defend it against alternatives but have contented myself with referring to supporting texts and pointing to its overall coherence. In conclusion, though, I wish to consider the alternative interpretation offered by Bernard Williams on the central point of the nature of Cartesian doubt. I choose Williams as a good representative of a fairly standard line of interpretation.

On my interpretation, to doubt some proposition P Cartesianly is not to suspend one's assent to P but rather to suspend one's assent to the proposition that one's mode of apprehending P is satisfactory for the inclusion of P in *scientia*. Thus I contend that, to understand Descartes, we must distinguish between those passages in which by "doubting" P he means no longer assenting to P, and those in which by "doubting" P he means Cartesianly doubting P. Williams interprets Descartes as

proposed for our belief has been revealed by him': but there I was speaking not of human scientific knowledge, but of faith. And I did not assert that by the light of grace we clearly know the very mysteries of faith—though I would not deny that this too may happen—but only that we trust that they are to be believed. No one who really has the Catholic faith can doubt or be surprised that it is most evident that what God has revealed is to be believed and that the light of grace is to be preferred to the light of nature" (CSMK: 191).

uniformly meaning the same thing by "doubt"—namely, doubting P is suspending one's assent to P. He says that

> the method of doubting everything until one reaches, if one can, something that cannot be doubted, is presented as a strategy, as a systematic way of achieving something which is Descartes' aim: this is to discover the truth.[14] And then he continues: "the strategy is to aim for certainty by rejecting the doubtful. To reject the doubtful here means, of course, to suspend judgment about it, or at most to treat it as false for the purposes of the argument. . . ."[15]

Williams is fully aware, however, of Descartes' Law of Assent: If we clearly and distinctly apprehend a proposition, we cannot refrain from believing it. And he also points to the passages in which Descartes insists that no sane person has ever "seriously doubted" that "there really is a world, and that human beings have bodies and so on. . . ." So how does Williams fit all this together, given that, in what I have called the Discipline of Doubt, we are to doubt that there really is a world and we are to doubt propositions that we have clearly and distinctly perceived?

Williams's solution is to distinguish between two different modes of having propositions in mind: If we have a proposition clearly and distinctly in mind, we cannot suspend assent to it, whereas if we do not have that same proposition thus in mind, we can (provided a good enough reason is offered to us). And this is, indeed, an authentically Cartesian point. This is what Williams says:

> Descartes says in the Second Replies of the things about which we can be perfectly certain, "we cannot think of them without believing them to be true," and he there claims that we cannot doubt them without thinking of them. From those premisses it follows, as he correctly points out, that we cannot doubt them. Yet it seems that there is something which counts as doubting even those propositions, so it must be possible for such a proposition to be sufficiently "before the mind" for one to entertain a doubt about it, but not be so clearly in view that one's belief in it is activated. This is not a very deep or difficult problem. All that is required is some way of referring to or indicating a proposition or idea of this kind without bringing it clearly to mind. A standard way of

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[14] Bernard Williams, *Descartes: The Project of Pure Inquiry* (New York: Penguin Books, 1986 repr.), p. 35.
[15] Ibid., p. 36.

> doing that will lie in deploying a word or sentence which expresses that idea or proposition, without, however, concentrating closely on what that word or sentence expresses. One can, granted this, entertain a doubt about an irresistible proposition, but only by not thinking about it clearly.[16]

Now in the first place, Williams does not formulate his distinction so that it applies directly to Descartes' argument. Descartes, remember, "doubts" all propositions about a physical world which we take to have been acquired by way of our senses, and does so with two broad questions. Why trust that which has even once deceived one? And, how does one know that one was not dreaming instead of sensing? This way of dealing with the beliefs we acquired by way of what we took to be perception is scarcely "deploying a word or sentence which expresses that idea or proposition, without, however, concentrating closely on what that word or sentence expresses."

But no matter. The crucial issue is this: Williams interprets Descartes as saying that by the Discipline of Doubt we bring ourselves to the point where we really do not believe any of the things "doubted"; a state which, for many propositions, can only be achieved, he says, by not having the doubted proposition clearly in mind. On Williams's interpretation, the mind is (almost entirely) emptied of assent by the doubt Descartes recommends—vacuumed clean. On my interpretation, by contrast, the mind remains very full, since "Cartesianly" doubting a proposition does not consist of withdrawing assent from that proposition.

What is to be said for my interpretation on this point and against the Williams style of interpretation? Well, there is, for one thing, the inherent implausibility of anyone's really believing that by those three broad swipes that Descartes uses, one can bring oneself to the point of believing almost nothing. The situation does not change if one dwells on those broad swipes, as Descartes says we should (Second Replies, CSM II: 94; see also First Meditation, CSM II;15). What the meditating which Descartes recommends might have a chance of accomplishing—so it seems to me—is that for which Descartes on my interpretation proposed it: freeing us up from our *praejudicia* as to what we are certain of.

Secondly, and more importantly, there is Descartes' insistence that practicing his Discipline of Doubt does nothing to disturb the beliefs presupposed in the conduct of our lives. In particular, everybody always believes he has a body. Williams interprets Descartes as meaning that one can switch in and out of believing that one has a body. But that is not what Descartes says.

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[16] "Descartes' Use of Skepticism" in Miles Burnyeat (ed.), *The Skeptical Tradition* (Berkeley & Los Angeles, University of California Press, 1983), pp. 337-52.

But thirdly, and most importantly, the Williams style of interpretation renders Descartes' strategy in the *Meditations* fundamentally confused. Let us suppose, for the sake of the argument, that doubting P was always to be understood as refraining from asserting to P. Descartes offers reasons for doubting P. And if I have a good reason for doubting P, then obviously I am not entitled to go ahead and believe P until that reason has been answered. Now it turns out that even when we have not excluded the possibility of the demon, there are a few propositions of which we can be certain that if they are apprehended clearly and distinctly, they are true. Indeed, we can be certain that if they are apprehended at all, they are true. These propositions of the *cogito*-sort can be seen without further ado to be not only indubitable but incorrigible. But most of the propositions which Descartes uses in the argument stretching from the second to the fourth meditation are not of that sort. About them Descartes instructs us, on the Williams interpretation, to doubt them, no longer believe them. Hence they are not available to us for use in any argument. What Williams would reply is not entirely clear; perhaps, that when we apprehend them clearly and distinctly, we cannot refrain from believing them. But if so, the reply would be beside the point. If one has good reason not to assent to P but finds that in certain circumstances one cannot avoid doing so, then surely the right thing to do is to avoid those circumstances as much as possible, rather than getting oneself into those circumstances and concluding that in those circumstances one is entitled to assent to P.

The problem is an old one in Descartes interpretation. Commentators have seen that the doubt which Descartes urges is almost totally comprehensive in its scope; only a few beliefs of the *cogito*-sort escape. But they have also seen that we need to have more than such beliefs left over, after we have followed the instructions to doubt, if we are to construct the *Meditations* argument. Thus a dilemma: Either one grants the radical scope of the doubt that Descartes urges, and finds oneself without enough entitled assentings left over to construct the argument; or one reserves enough assentings for the construction of the argument, and limits the scope of the doubt Descartes recommends. The Williams style of interpretation is an attempt to escape this dilemma; it says that one can both follow the radical instructions for doubt and have sufficient propositions left over for the argument. In following the instructions, one thinks of propositions unclearly and indistinctly but yet well enough to doubt them; in constructing the argument, one thinks of them clearly and distinctly. But that proposed solution just overlooks the fact that the radical doubt leaves one without title to use, in the argument, the propositions one was instructed to doubt. One does not receive that title until the end of the argument, when the reason for the radical doubt has been answered and the instruction lifted.

One can only escape the dilemma by distinguishing doubting P from "Cartesianly" doubting P. Cartesian doubt leaves us with more than enough propositions to construct the argument, since, for most propositions, it never enjoins us to give up our assent to them—only to give up our assent to the proposition that our mode of believing them is certain.

But let us look at the central piece of textual evidence which Williams offers for his interpretation. Found in the Seventh Set of Replies, it goes as follows:

> So long as we attend to a truth which we perceive very clearly, we cannot doubt it. But when, as often happens, we are not attending to any truth in this way, then even though we remember that we have previously perceived many things very clearly, nonetheless there will be nothing which we may not justly doubt so long as we do not know that whatever we clearly perceive is true (CSM II:309).

It may be noticed that this passage is not explicitly incompatible with my interpretation. On my interpretation, Descartes in the first sentence is saying that when we clearly and distinctly perceive a proposition, we cannot refrain from believing it. In the second he says that so long as we do not know that the phenomenology of clarity and distinctness guarantees truth, there is no belief-state at all about which we cannot doubt that it has the highest epistemic status—certitude. But though the passage does not explicitly contradict my interpretation, nonetheless the point it seems to be making is the Williams point.

Let us consider the context in which the passage occurs. In the preceding paragraph, Descartes is making exactly the point on which I have grounded my interpretation, namely that his "metaphysical" doubt does not change and is not meant to change anything in practical life. In the passage he expressed his annoyance that Bourdin would have thought otherwise:

> I said at the end of the First *Meditation* that we may doubt all those things which we have not yet perceived with sufficient clarity, since our doubt is based on 'powerful and well thought-out reasons.' But I said this because at that point I was dealing merely with the kind of extreme doubt which, as I frequently stressed, is metaphysical and exaggerated and in no way to be transferred to practical life. It was doubt of this type to which I was referring when I said that everything that could give rise to the slightest suspicion should be regarded as a sound reason for doubt. But my friendly and ingenuous critic here puts forward as an example of the things that I said we could doubt 'for powerful reasons' the

> question of whether there is an earth, or whether I have a body, and so on; the effect is that the reader, if he knows nothing of my 'metaphysical' doubt and refers the doubt to practical life, may think that I am not of sound mind (CSM II:308-9).

What then follows is the passage which Williams cites, and which we quoted above. That passage then continues as follows:

> From the fact that at one point I said that there was nothing that we might not doubt—namely in the First Meditation, in which I was supposing that I was not attending to anything that I clearly perceived—he draws the conclusion that I am unable to know anything certain, even in the following *Meditations*.This is to suggest that the reasons which may from time to time give us cause to doubt something are not legitimate or sound unless they prove that the same thing must be permanently in doubt (CSM II:309).

In the entire passage, then, Descartes makes these three points:

> (1) "Metaphysical" or exaggerated doubt is not meant to change anything at all in practical life.
>
> (2) One can emerge from metaphysical doubt. Metaphysically doubting proposition P is not a permanent condition, nor is it meant to be.
>
> (3) We manage to doubt those propositions metaphysically whose clear apprehension compels assent by just recalling the fact that we have had the experience of clear apprehension, and then observing that we do not find ourselves compelled to believe that this coincides with incorrigibility.

Thus the passage as a whole is not just logically compatible with my interpretation but supports it: "metaphysical" doubt does not alter those beliefs which are presupposed in practical life.

Still, why does Descartes draw the contrast between attending "to a truth which we perceive very clearly" and remembering "that we have previously perceived many things very clearly"? Well, on my interpretation, Cartesian (metaphysical) doubt does indeed involve a shift of focus. On the one hand, there is the phenomenon of one's assent being compelled by one's clear and distinct apprehension of such a proposition as 2+2=4. On the other hand, to engage in Cartesian doubt of that belief is to raise a question about one's mode of apprehension of it, a question which requires recollection. It is to raise this question: Was one's assent-compelling, clear and distinct apprehension of this proposition a guarantee of its truth? But of course one means this question generally: In general, is our assent-compelling, clear and distinct apprehension of propositions a guarantee of their truth? Though I do not contend that Descartes' way of pointing to this change of focus is entirely lucid, it is also not entirely infelicitous. Cartesian doubt does involve the change of focus to which Descartes here points: One remembers that one has had clear and distinct, assent-compelling, apprehensions and then asks whether those are incorrigible.

Why does Descartes not make the point more lucidly? I have contended that Descartes operates with a distinction between two types of doubt, and that recognizing this is fundamental to interpreting his thought. But when Descartes tries to explain the distinction, he almost always says that doubt metaphysical is an extreme, exaggerated, kind of doubt—that its scope is much wider than ordinary doubt. Yet when someone draws what would seem to be the obvious implication, that in metaphysical doubt we withdraw assent from all, or almost all, the things that we customarily assent to, even from the existence of a world, Descartes always emphatically insists that that is not his meaning. It is true, of course, that we are to doubt "Cartesianly" many more propositions than we are to doubt ordinarily. But to cite that as the difference is misleadingly off-target.

I suggest that what we witness in Descartes' writings is the struggle to get clear on what exactly the project was to which he had committed himself. He was, in this respect, like all the great philosophers. In my discussion I have obliterated most signs of the struggle, instead offering, as it were, a "rational reconstruction" of the Cartesian project. And then secondly, and more specifically, I suggest that at the heart of, or near the heart of, Descartes' struggle, was the struggle to get clear on the distinction between certainty as an objective matter and certainty as extremely firm assent. The distinction was made later in the century by the Royal Society group in England, though even by them, not with sure-handedness. Descartes, though groping for the distinction, was even less far along the road of making it with clarity than they were; there are passages in which one can see him shifting back and forth between the two senses. If this speculation is correct, then pretty much everything falls into place. Metaphysically doubting P is not suspending one's assent to P but wondering whether one's mode of believing P has the objective epistemic status of certainty—or more than wondering, having reasons which lead one to suspend for the time being one's belief on the matter. Usually, however, assent to P continues throughout the process of doubting Cartesianly whether the objective epistemic status of one's mode of assent to P is that of certainty.

I return to my opening points. Starting with Plato, if not before, a long line of Western thinkers has proposed that, insofar as possible, we turn away from *doxa* and work at the construction of *scientia*. The high medievals qualified this vision: though *scientia* is indeed superior to *doxa*, *doxa* achieved by extracting from our intellectual tradition the unified wisdom embedded therein is eminently worth struggling for.

John Locke believed that *scientia* came to very little; the only significant option to *skepticism* was the regulation of *doxa*. Yet Locke lived at a time when no one believed any more that the European intellectual tradition contained a unified body of wisdom. Locke's recommendation, in that crisis, was that we regulate *doxa* by listening to the voice of reason. I have argued that Locke was not, on this point, following in the footsteps of Descartes. Descartes' lifetime project was rather to give that ancient alluring vision of *scientia* one last fling for the money. Seldom had *scientia* been properly pursued. The call of the day, as Descartes saw it, was resolutely to pursue *scientia* as it ought to be pursued and watch its scope expand before our eyes. The regulation of *doxa* was of little interest to him.[17]

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[17] For challenging and helpful discussions on this paper I wish to thank especially Richard Bernstein and Stephen Voss; and the philosophy departments of Calvin College, The New School for Social Research, Notre Dame University, the University of Massachusetts, and Yale University.

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Scientific and Practical Certainty in Descartes

by Stephen Voss

We used to think that Descartes required absolute certainty of scientific belief, and that he prescribed reason rather than experience or observation to get it. Decades ago Ralph Blake and Alan Gewirth convinced us otherwise.[1] We now know that he prescribed a posteriori procedures for nearly all the scientific questions he treated. It has seemed natural to suppose that he relaxed his demand for certainty, and allowed a high degree of probability to suffice, marking the requisite degree of probability with the title "moral certainty."

It seems to me that the pendulum has swung too far. Descartes does not reduce moral certainty either to absolute certainty or to any degree of probability. He finds connections between what makes a belief scientifically acceptable and what makes a belief applicable to ordinary life, so that a single standard is appropriate both for science and for its applications. This standard is *moral certainty*. It is Descartes's *normal* standard for judging the acceptability of a posteriori belief. As such it is worth taking seriously.

Can anything short of absolute certainty be intellectually acceptable? Can anything short of absolute certainty really suffice for application to ordinary life? Descartes's choice of the term "moral certainty"

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[1] Ralph M. Blake, "The Role of Experience in Descartes' Theory of Method," *Philosophical Review* 38 (1929), 125-43; Alan Gewirtz [i.e., Gewirth], "Experience and the Non-mathematical in the Cartesian Method," *Journal of the History of Ideas* 2 (1941), 3-21. More recently see Gerd Buchdahl, *Metaphysics and the Philosophy of Science* (Oxford: Blackwell, 1969), chapter 3; and Desmond M. Clarke, *Descartes' Philosophy of Science* (University Park: Pennsylvania State University Press, 1982) (henceforth DPS). Each of the latter works provides a wealth of material for an account of the conditions under which Descartes regards belief as acceptable in science. They both help us see, for example, how Descartes mingles metaphysical and empirical considerations, foiling any neat classification of Part II of the *Principles* as a priori and Parts III and IV as a posteriori.

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stems from his conviction that only some variety of certainty can meet these two requirements.

Nearly all interpretations of Cartesian moral certainty read it as a high degree of epistemic probability.[2] Such accounts depict Descartes as anticipating probability theorists like Pascal and Leibniz. But Descartes has little interest in probability. As he sees things, to accept or to act upon belief that is only probable is not to attain an ideal; it is to fall short of one.

For on the one hand Descartes held that probability was insufficient for *scientia*. He writes in the *Discourse on Method*, "I held as well-nigh false everything [in philosophy] that was merely probable [*vraisemblable*]," and "insofar as [the sciences] borrow their principles from philosophy I decided that nothing solid could have been built upon such shaky foundations."[3] He underscores the point to Mersenne: "I consider almost as false whatever is only a matter of probability [*probable*]."[4]

But Descartes also held that only certainty is really sufficient for practice. It is true that we must often act on opinion whose certainty is lower than what we aim for in metaphysics and science, and that sometimes we must act on opinions no more probable than their contraries.[5] But that in no way entails that some lower level is sufficient for ordinary life. For the results of accepting a proposition with false consequences in science are innocuous, while the consequences of acting on one can be horrendous. If we are to believe the fable about his youth which Descartes tells in the *Discourse*, this is one reason why he abandoned his studies to seek knowledge in "the great book of the world":

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[2] See, for example, Etienne Gilson, *René Descartes, Discours de la methode: texte et commentaire* (4th edition, Paris: Vrin, 1967), pp. 358-99; and Daniel Garber, "Science and Certainty in Descartes", in Michael Hooker, ed., *Descartes: Critical and Interpretive Essays* (Baltimore: Johns Hopkins University Press, 1978), p. 147.

[3] *Discourse on Method*, Part I, in Charles Adam and Paul Tannery, eds., *Oeuvres de Descartes* (new presentation: Paris: Vrin, 1964-74) (henceforth AT) VI, 8-9: John Cottingham, Robert Stoothoff, and Dugald Murdoch, trans., *The Philosophical Works of Descartes* (Cambridge: Cambridge University Press, 1985-86) (henceforth CSM) I, 115.

[4] To Mersenne, 5 October 1637: AT I, 450-451: John Cottingham, Robert Stoothoff, Dugald Murdoch, and Anthony Kenny, trans., *The Philosophical Works of Descartes: The Correspondence* (Cambridge: Cambridge University Press, 1991) (henceforth CSMK), p. 74. He distinguishes *scientia* from *persuasio* to the same end: "knowledge [*scientia*] is conviction [*persuasio*] based on a reason so strong that it can never be shaken by any stronger reason" (to Regius, 24 May 1640: AT III, 65: CSMK, p. 147).

[5] *Discourse*, Parts III and IV: AT VI, 25 and 31: CSM I, 123 and 126; Meditation VI: AT VII, 90: CSM II, 62; Second Replies: AT VII, 149: CSM II, 106; Fifth Replies: AT VII, 350-1: CSM II, 243; to Hyperaspistes, August 1641: AT III, 422-23: CSMK, pp. 8-9; *Principles* I, 3.

> For it seemed to me that much more truth could be found in the reasonings which a man makes concerning matters that concern him than in those which some scholar makes in his study about speculative matters. For the consequences of the former will soon punish the man if he judges wrongly, whereas the latter have no practical consequences and no importance for the scholar except that perhaps the further they are from common sense the more pride he will take in them. . . .[6]

I

Absolute certainty was Descartes's original standard for science. According to the manifesto in Part VI of the *Discourse*, scientific truths were to be derived from metaphysical propositions in such a way that the very certainty of metaphysics was preserved.[7]

Descartes had described the procedure in detail four years earlier, in *Le Monde*.[8] Yet even in these palmy days the enterprise encountered two distinct snags. First, in order to carry out the derivation in *Le Monde,* Descartes needed to rely on a good number of suppositions whose truth he had not established.[9] Secondly, very few scientific truths could be derived with certainty from metaphysical principles.[10]

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[6] Part I: AT VI, 9-10: CSM I, 115. Descartes wrote to Hyperaspistes in August 1641 that "it would indeed be desirable to have as much certainty [*certitudo*] for the conduct of our lives as is needed for the acquisition of knowledge [*scientia*] . . ." (AT III, 422: CSMK, pp. 8-9). Kenny comments on this passage as follows: "Hyperaspistes had objected to Descartes' admission that less certainty was needed for conduct than for speculation (AT VII, 351; CSM II, 243). It is more important, he said, to avoid sin than to avoid error in metaphysics: 'why then do you suppose or demand a lesser truth in morals than in science?' (AT III 398)" (CSMK, p. 9, n. 1; the same note appeared in Kenny's earlier edition of Descartes's letters). But the passage contains no such "admission" by Descartes. That is why he sees his position as compatible with that of Hyperaspistes. Descartes had said only that "when it is a question of organizing our lives, it would, of course, be foolish not to trust the senses." Kenny's Descartes infers that less certainty is needed if less is obtainable, but Descartes himself says only that it is foolish to hold out for more when more is not forthcoming, a point he happily makes in the texts cited in n. 5. Equally, in to [Mesland], 2 May 1644: AT IV, 115: CSMK, p. 233, he admits only that to believe a falsehood with good reason, when there is no moral possibility of knowing better, "is not strictly an error." You can't always get what you need - and, according to texts like the present one, that may include what is genuinely "sufficient for application to ordinary life," in the words of *Principles* IV, 205. Thus, when Descartes says (AT VII, 350: CSM II, 243) that he has previously insisted on the distinction between action and scientific investigation, CSM refer us (II, 243, n. 3) to Meditation I (AT VII, 22: CSM II, 15) and to the Fourth Replies (AT VII, 248: CSM II, 172); and in neither of *those* passages either does Descartes admit that less certainty is needed for conduct than for speculation. Kenny's error is *just* the sort of thing this paper aims to combat.

But Descartes makes a surprising claim in the *Discourse,* which initiates his assault on these two difficulties. Proof can proceed not only from metaphysical certainties but from the data of observation. In particular, it is possible to *prove* hypotheses concerning causes by observation of effects.[11] When Fromondus challenged Descartes's "hypotheses" in the *Meteorology* about the shape of water particles, Descartes used the challenge as an opportunity to explain how observation can yield proof. In a letter to Plempius for Fromondus in October of 1637, just three months after the *Discourse* was published, he wrote:

> If [M. Fromondus] would be good enough to read with sufficient attention everything I wrote in the *Meteorology* and the *Dioptrics,* he would find six hundred reasons from which *just as many syllogisms could be constructed to prove* [*demonstranda*] *what I say.* They would go like this. If water is more fluid and harder to freeze than oil, this is a sign that oil is made of parts which stick together easily, like the branches of trees, while water is made of more slippery parts, like those which have the shape of eels. But experience [*experientia*] shows that water is more fluid and harder to freeze than oil. Ergo, etc.
>
> Again, if cloths soaked in water are easier to dry than cloths soaked in oil, that is a sign that the parts of water have the shapes of eels, and can thus easily come out through the holes in the cloth, and that the parts of oil have the shapes of branches, and thus get entangled in the same holes; but experience shows, etc. . . . [and so on.]
>
> Although each of these points taken by itself gives only probability [*non nisi probabiliter persuadeant*] to the conclu-

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[7] AT VI, 63-64: CSM I, 143-44.

[8] AT XI, 31-48: CSM I, 90-98.

[9] See Clarke, DPS, pp. 87-95, for some of the details.

[10] See *Discourse,* Part VI: AT VI, 64: CSM I, 144.

[11] *Discourse,* Part VI: AT VI, 76: CSM I, 150. The term translated "hypotheses" here is "*suppositions.*"

> sion, *taken together they amount to a proof* [*demonstrant*] *of it.*[12]

The crucial elements for his doctrine of moral certainty were already present in the writings of 1637 and 1638.[13] But it was only in the *Principles of Philosophy*, published in 1644, that Descartes forged a coherent doctrine from them. Those things are "morally certain [*certa moraliter*]," according to *Principles* IV, 205, which have "sufficient [certainty] for application to ordinary life, even though they may be uncertain [*incerta*] in relation to the absolute power of God."

Edwin Curley has observed that this characterization raises a difficulty of the utmost seriousness.[14] If a morally certain proposition must have "sufficient certainty for application to ordinary life," it is natural to take "sufficient" to mark some degree of epistemic probability, less than certainty, but so near to it as to render action on any proposition with that probability rational. And Curley argues that since rationality of action is a function of two variables—both desirability and probability of the possible outcomes of available actions—there can be no general answer to the question how probable an outcome must be for action based on it to have a given degree of rationality. It is easy to see that Curley is absolutely right.

How likely is it that Descartes—of all people—forgot that utility has a bearing on rationality, and mistook a function of two variables for a function of one? But if he did not make this elementary error, what did he have in mind when he linked moral certainty with rationality of action? I shall argue that he elaborated a theory on which it became possible to locate a class of propositions, some with probability considerably less than one, such that it will always be rational to act on them.

II

We get a clue to a more fruitful approach to moral certainty when we observe that Descartes originally introduces the notion in the *Principles* in order to solve a problem of scientific, not practical, acceptability. The central idea of *Principles* IV, 205 is that of 'sufficient certainty for application to ordinary life." But that locution has already been centrally employed in article 204, in which Descartes treats the question of adequacy for practice as requiring an answer to a prior question, that of adequacy for science.

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[12] To Plempius for Fromondus, 3 October 1637: AT I, 422-23: CSMK, pp. 65-66 my emphasis; translation of first paragraph corrected. See *Meteorology*, Discourse I: AT VI, 231-39 (in which Descartes uses the term "hypotheses"), and Fromondus to Plempius, 13 September 1637: AT I, 406.

[13] These include the texts mentioned in nn. 20 and 21 below, as well as those just cited. In a response to the 1991 version of this paper, Daniel Garber argued that Descartes arrived at the instrumentalism of the *Principles* only after he wrote these texts. I am sure that this is correct.

[14] Edwin Curley, "Certainty: Psychological, Moral and Metaphysical" in Stephen Voss, ed., *Essays on the Philosophy and Science of René Descartes* (New York: Oxford, 1993), pp. 19-29 and n. 19.

Descartes always views metaphysical certainty as the best possible outcome of an epistemic enterprise. But the thesis of article 204 is that the scientific results that he himself has gained may appropriately be judged by a standard short of metaphysical certainty, and that even given the difficulties noted above his results pass the test. This standard is, I shall argue, identical with the one he labels moral certainty one article later. Indeed, he regards moral certainty as sufficient for practice only because it is acceptable on scientific grounds. Let us see why.

Descartes defends his standard by one of the seventeenth century's many comparisons between two clocks. I mark two sentences in the passage with Roman numerals for later reference.

> Just as the same craftsman could make two clocks which tell the time equally well and look completely alike from the outside but have completely different assemblies of wheels inside, so the supreme craftsman of the real world could have produced all that we see in several different ways. [I] I am very happy to admit this; and I shall think I have achieved enough provided only that what I have written is such as to correspond accurately with all the phenomena of nature. [II] This will indeed be sufficient for application in ordinary life, since medicine and mechanics, and all the other arts which can be fully developed with the help of physics, are directed simply towards applying certain observable bodies to each other in such a way that certain observable effects are produced as a result of natural causes. And by imagining what the various causes are, and considering their results, we shall achieve our aim irrespective of whether these imagined causes are true or false, since the result is taken to be no different, as far as the observable effects are concerned.[15]

To say that hypotheses "correspond accurately with all the phenomena of nature" is to ascribe a certain theoretical merit to them. That is what sentence (I) does. Sentence (II) immediately ascribes practical merit to such hypotheses. That is because Descartes has seen that if one of his hypotheses has that *theoretical* merit it will also have a certain *practical* merit: if only a hypothesis can be shown to predict correctly all observable outcomes of all observable operations, then that hypothesis is reasonable to act upon.

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[15] Larry Laudan argues convincingly that this passage had a large influence on British conceptions of scientific method, mainly in inculcating a hypothetical rather than a Baconian enumerative ideal. See "The Clock Metaphor and Hypotheses: The Impact of Descartes on English Methodological Thought, 1650-1670," Chapter 4 in his *Science and Hypotheses* (Boston: D. Reidel, 1981). But if my speculations toward the end of Section IV are right, Descartes may have *required* the enumerations he often mentions in order to gain moral

This is true because of an important link between the idea of human observation to test a hypothesis and the idea of rational human action on the basis of a hypothesis: *outcomes of actions can differ in desirability only insofar as they differ observably.* Insofar as you are warranted in believing that the medicine will cure you with no side effects, you are reasonable to take it—no matter whether it cures via a mechanical effect on your body or via a psychic effect on the demon causing your illness.

Descartes early faced two theoretical difficulties. How can suppositions be accepted when their truth has not been established? How can hypotheses be proven if they cannot be derived from metaphysical certainties? He faced a difficulty concerning practice as well: what sort of warrant must a proposition have to render action on it rational? The link between observability and desirability suggests that the solution to the difficulties of theory may solve the difficulty of practice as well. Here is the solution to which Descartes was led.

> MC A hypothesis is *morally certain* when (i) it licenses predictions about the observable outcomes of observable operations and (ii) it is certain that every such prediction it licenses is true.

On this conception, one might hope that sufficient observations will render certain, not a hypothesis, but all its observational consequences. That is what it is for the hypothesis itself to be morally certain. The

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certainty for his hypotheses. Laudan does not take seriously in this context Descartes's expressed commitment to gaining certainty for his hypotheses by observational means: "Descartes concedes that science is necessarily hypothetical and probabilistic . . ." (p. 32; see also p. 52, n. 34). While Descartes (often) concedes the need for hypotheses, I know of no passages in which he concedes that science must be probabilistic. This impressive article sheds a great deal of light on some of the Cartesian texts that are centrally relevant to the present paper, and also on the way Boyle, Glanvill, and Power interpreted these texts—even providing key references on the historical question how Descartes's talk of moral certainty was understood at the time. While I think Descartes remained a persistent foe of probabilism, Laudan shows that Glanvill, in passages otherwise strikingly similar to *Principles* IV, 204-5, derived deeply probabilistic morals from his reading of Descartes (pp. 45-46).

word "certain," placed just as it is in clause (ii) of MC, is now the residue of the term "certain" in the term "morally certain" itself.[16]

The most striking and explicit presentation of the doctrine of moral certainty occurs in *Principles* III, articles 44-47, in which Descartes defends his hypotheses concerning the original configuration of matter in the universe. The passage is idiosyncratic, for it relies on the doctrine to resolve a sticky conflict between Scripture and Cartesian cosmology, and the idiosyncrasy displays in bold relief the radical nature of Descartes's doctrine.

Revelation teaches that things like plants, animals, and stars were created perfectly formed; and what God has revealed is "more certain than anything else [*omnium certissima*]."[17] So the hypothesis Descartes prefers—that the world began with approximately equal particles of moderate size—can actually be known to be false. Still, acceptable hypotheses may be improbable, and even known to be false. The original state of nature is as hidden as the inside of a clock, and Descartes relies on the same principle in evaluating hypotheses about each of these cases. When neither metaphysics nor observation can establish the truth, "we are . . . free to make any assumption [*assumere*] on these matters with the sole proviso that all the consequences of our assumption must agree with our experience" (a. 46)—i.e., with the proviso that the assumption must save the phenomena. Given that proviso, the supposition's consequences must be "true and certain [*vera & certa*]" (a. 47, title)—precisely the scientific merit that MC contemplates for morally certain hypotheses. Moreover, such a hypothesis will also possess the practical merit associated with the morally certain:

> . . . if everything deduced from it agrees with our observations, . . . we shall see that our hypothesis yields just as much practical benefit for our lives as we would have derived from knowledge of the actual truth, because we shall be able to use

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[16] On this conception metaphysical and moral certainty are logically distinct. On the orthodox conception I combat here, which identifies moral certainty with high probability, Descartes has left curiously unanswered the obvious theoretical question whether metaphysical certainty entails moral certainty. On the present conception he implicitly answers the logical question when in Part VI of the *Discourse* he sketches two distinct procedures for establishing a hypothesis—derivation from metaphysical truth and observation. For there is no reason to expect logical links between "derivation certifies *p*" and "observation certifies *p*." This procedural independence mirrors the logical independence of "*p* is certain" and "*p* is morally certain" according to MC. And I would expect Descartes to hold that the doctrine of the creation of the eternal truths is metaphysically but not morally certain; that the doctrine of the creation of an initially chaotic physical universe—discussed immediately below—is morally but not metaphysically certain; and that the laws of motion are certain in both ways.

[17] *Principles* I, 76.

> it just as effectively to manipulate natural causes so as to produce the effects we desire (a. 44).

Here, following the pattern of Part IV, article 204, practical merit is attributed to such hypotheses because of the crucial connection between predictability of observational consequences and sufficiency for application to ordinary life.

None of these texts mentions moral certainty by name; very few passages do, in fact.[18] But I take them to support the present interpretation nonetheless, because (a) the standard they offer is not that of a certain level of probability but that of success in predicting observable outcomes; (b) the standard that *Principles* III, 44-47 offers is the one that *Principles* IV, 204 offers; (c) IV, 204 describes that standard as one of sufficiency for application to ordinary life; and (d) the following article, IV, 205, explicates moral certainty precisely as sufficiency for application to ordinary life.

The present conception of moral certainty makes it easy to understand the value that scientific belief has for Descartes. Such belief may be worthwhile for its own sake, as an intrinsic good; and it may be worthwhile instrumentally, as the foundation for medicine, mechanics, and morals.[19] Metaphysical certainty is the right standard for measuring its intrinsic value. And moral certainty is the right standard for measuring its instrumental value.

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[18] The passage in *Discourse*, Part IV (AT VI, 37-38: CSM I, 129-30) is so schematic that both the present proposal and the probabilistic ones square with it. We learn there only that "*it seems* that we cannot doubt [morally certain propositions] without extravagance," that they are less certain than metaphysically certain ones, and that they include our having bodies and the existence of stars and earth (my emphasis). (The phrase Descartes uses here is "*une assurance morale*;" the one he accepts in the Latin translation [AT VI, 561] is "*certitudo, ut loquuntur Philosophi, moralis.*") The relevant passages in the Seventh Replies are similarly unhelpful: Descartes distinguishes the context of metaphysical doubt from "practical life" (AT VII 460: CSM II, 308-9) and distinguishes metaphysical knowledge from "knowing in the practical sense which suffices for the conduct of life" (AT VII, 475: CSM II, 320), but does not clarify those quoted phrases. When first he speaks of "*certitude . . . morale*" (to Mersenne, 21 April 1641: AT III, 359: CSMK, p. 179) he does not clarify the notion except to distinguish it from certainty unqualified. Finally, *Discourse*, Part V: AT VI, 57: CSM I, 140 speaks of a "moral impossibility" (though the modifier is abandoned in the Latin translation).

[19] See to Elisabeth, 4 August and 6 October 1645: AT IV, 263-65 and 304-9: CSMK, pp. 256-7 and 268-70; the Letter-Preface to the *Principles*, passim; and *Principles* IV, 204, quoted above. There are, however, passages in which Descartes denies that knowledge is an intrinsic good, for example in to Christine, 20 November 1647: AT V, 82-83: CSMK, pp. 324-5.

III

Two early passages help us place this doctrine within a well-known historical tradition. Descartes billed the *Dioptrics* as meant to *explain* certain optical phenomena on the basis of certain suppositions about light, and he inferred in Discourse I of the work that he "need not attempt to say what is its true nature." He found a precedent for his procedure:

> In this I am imitating the astronomers, whose assumptions [*suppositions*] are almost all *false or uncertain* [*fausses ou incertaines*], but who nevertheless *draw many very true and very certain* [*tres assurées*] *consequences from them* because they are related to various observations they have made.[20]

A year later he wrote in the same vein to Mersenne that the hypotheses of Ptolemy in astronomy and Vitellio in optics were less certain than those of Archimedes in mechanics—themselves "not . . . strictly true [*exactement vraies*]"—"but that is not a sufficient reason for rejecting the demonstrations [*demonstrations*] which they have based on them." Why not?

> In such matters people are satisfied if the authors' assumptions [*suppositions*] are not obviously contrary to experience and if their discussion is coherent and free from logical error, even though their assumptions may not be strictly true. . . . If people simply say that they do not believe what I have written, because I deduce it from certain assumptions [*certaines suppositions*] which I have not proved [*prouvées*], then they do not know what they are asking or what they ought to ask.[21]

Descartes places his own view historically through his reference to "the astronomers." For centuries those who studied the stars observationally called themselves "astronomers," while those who studied the stars *a priori* called themselves "physicists." For many "physicists," from Aristotle to Kepler and Galileo, a hypothesis about the stars must be known to be true in order to be acceptable; ideally, it will be derivable from metaphysical principles. For many "astronomers," from Plato according to Simplicius to Aquinas, Piccolomini, and Melanchthon, an acceptable hypothesis need not be true; it must only "save the appearances." The latter viewpoint is well expressed in Osiander's preface to Copernicus's *De revolutionibus*, published in 1543 and certainly known to Descartes:

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[20] AT VI, 83: CSM I, 152-53; my emphasis.
[21] To Mersenne, 17 May 1638: AT II, 142-44; CSMK, pp. 103-4.

> For the astronomer's job consists of the following: To gather together the history of the celestial movements by means of painstakingly and skillfully made observations, and then—since he cannot by any line of reasoning reach the true causes of these movements—to think up or construct whatever hypotheses he pleases such that, on their assumption, the self-same movements, past and future both, can be calculated by means of the principles of geometry. . . . It is not necessary that these hypotheses be true. They need not even be likely. This one thing suffices, that the calculation to which they lead agree with the result of observation.[22]

IV

In a late passage Descartes adverts to a history behind his term—"moral certainty, as the philosophers call it [*certitudo, ut loquuntur Philosophi, moralis*]."[23] The text reinforces the obligation to uncover the history if we hope to understand the philosopher's conception. We find here, as elsewhere, that Descartes commandeers a theological conception, honing it for his own philosophical ends.

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[22] From Osiander's preface "Ad lectorem, de hypothesibus hujus operis" to Copernicus's *De revolutionibus orbium coelestium* (Nurenberg, 1543), as translated in Pierre Duhem, *To Save the Phenomena: An Essay on the Idea of Physical Theory from Plato to Galileo*, trans. E. Doland and C. Maschler (Chicago: University of Chicago Press, 1969), pp. 66-67. Descartes's evocation of "the hypotheses of the astronomers" is examined admirably in M. Martinet, "Science et hypotheses chez Descartes," *Archives internationales d'histoire des sciences*, 1974, pp. 319-39, reprinted in Geneviève Rodis-Lewis, ed., *La Science chez Descartes* (New York: Garland, 1987), though Martinet holds that Descartes consistently resists such "conventionalism." Duhem's critics accurately observe that some of the astronomers he describes as instrumentalists may not have been, particularly when it came to terrestrial science; and that not all astronomers known to Descartes were "astronomers" in the particular way he has in mind here. See Ernan McMullin, "The Goals of Natural Science," *Proceedings and Addresses of the American Philosophical Association*, vol. 58 (1984-85), no. 1, pp. 44-48.

[23] AT VI, 561: from the 1644 Latin translation of the *Discourse*, approved by Descartes; original passage at AT VI, 37-38: CSM I, 130.

Descartes signals the theological provenance of "moral certainty" the first time he uses the term, years before he thinks of using it to state his solution to the problems of *Le Monde*.

> I am surprised at the objections of your doctors, namely that we have no certainty, according to my philosophy, that the priest is holding the host at the altar, or that he has water to baptize, etc. Even among scholastic philosophers, whoever said that there was any more than moral certainty [*autre certitude que morale*] about such things? Theologians say that it is a matter of faith to believe that the body of Jesus Christ is in the Eucharist, but they do not say that it is a matter of faith to believe that it is in this particular host. For that you have to suppose, as a matter of ordinary human credence, that the priest had the intention to consecrate, and that he pronounced the words, and is duly ordained, and other such things which are by no means matters of faith.[24]

The example might have suggested where to look for Descartes's source. But Gilson missed the clue; his *Index Scolastico-cartésien* locates no earlier uses of the term, and is forced to cite a post-Cartesian use by Chauvin.[25] Succeeding historians of philosophy have come up equally empty.

Credit for the discovery must go to the historian of mathematics James Franklin. He points out that the term "*certitudo moralis*" was common in 16th century debates over probabilism, the ecclesiastical teaching that it is morally permissible to act on an opinion that is probable, even if the opposite is more probable. Perhaps the earliest use of the term is by Jean Gerson, Chancellor of the University of Paris and author of several of the manuals for priests which flourished following the decree of the Fourth Lateran Council in 1215 that each member of the Church must confess at least once a year. A kind of mathematical elegance characterizes the link between Gerson's example, for which I am indebted to Franklin, and Descartes's, just cited, which evoked the latter's first use of the term. In about 1400 Gerson advises priests worried that they are unworthy to celebrate mass because of "nocturnal pollution" to cease worrying, because absolute certainty is not required in such matters. If "evident certainty" were required,

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[24] To Mersenne, 21 April 1641: AT III, 359: CSMK, p. 179.

[25] Etienne Gilson, *Index Scolastico-cartesien*, 2nd. ed. (Paris: Vrin, 1979), p. 334. S. Chauvin, *Lexicon rationale sive Thesaurus philosophicus* (Rotterdam, 1692).

> it is clear that then no one, however pure and just, would be able to celebrate; it would not be possible unless a special revelation were made to him. Therefore there suffices the kind of certainty we usually look for and accept in moral matters. This certainty can be called moral or civil certainty, of which the Philosopher [Aristotle] speaks in *Ethics* I, ch. 3, saying: Our discussion will be adequate if it has as much certainty as the nature of the subject admits.[26]

The term was accepted as a designation of a supposed variety of probability: witness this account from a handbook for confessors written a century later:

> "Probable" is used in two ways. First as the opposite of hidden, that is what is proved by witnesses. . . . Second, as what pertains to opinion. And this in two ways. First, the object of a believed opinion; thus Aristotle [*Topics* I] says that the probable is what seems to be to all, or most, or the wise. . . . [A]ccording to the Chancellor [Gerson], what is thus probable is called morally certain [*certum moraliter*], because moral certainty [*certitudo moralis*] does not depend on evident demonstrations but on probable, rough, and figurative conjectures. . . . it is equally vicious for the mathematician to seek the persuasive as for the moralist the demonstrative.[27]

Not only sixteenth-century laxists but moral theologians and casuists three centuries earlier appealed to the Aristotelian distinction between mathematical certainty and what is to be sought in moral philosophy. Still, they took the distinction not simply as a reminder that certainty is not to be found in morals, but as a challenge to find something like it there. Deman observes that in cases where only probable knowledge exists, medieval moralists customarily emphasize that the decision must rest on an acute awareness of the contingency of the particular; and he then comments:

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[26] Jean Gerson, *De praeparatione ad missam*, in *Oeuvres complètes*, ed. P. Glorieux, vol. 9 (Paris, 1973): p. 35-50, at p. 37. Cf. D. C. Brown, *Pastor and Laity in the Theology of Jean Gerson* (Cambridge: Cambridge University Press, 1987), p. 69.

[27] Sylvester Prierias, *Summa* (about 1515), art. "*probabile*," as quoted by M. M. Gorce, "A propos de Barthélemy de Médina et du probabilisme," *Ephemerides Theologicae Lovanienses* 7 (1930), p. 480.

> They inherited this sentiment from classical tradition, above all Aristotle, for we know how the philosopher insists in his *Ethics* on the necessity to be content with a certainty of more modest rank, which lacks any of the rigor and infallible precision of mathematics. Not that they imitated Aristotle on every point, for they thought it possible to establish with a complete reliability the principles of the moral life, and on that basis they claimed to lead their certainties as close as possible to action; thus they achieved a moral *science* more scientific than the ethics of Greece.[28]

Medieval and Cartesian morals each begin by soberly noting the Aristotelian gap between mathematical certainty and the knowledge available for application to everyday life, but before very long each in its own way finds that gap intolerable and seeks the means to narrow it. The tendency is at least as old as Aquinas, who avoids inventing the notion of moral certainty but seizes on that of *legal* certainty in subtly undermining the Aristotelian distinction.

> Suspicion is of three kinds: One is the violent, to the contrary of which proof is not admitted, as when someone is found alone with a woman, naked on the bed, in a secret place, at a time apt for intercourse. The second is the probable, as when they are seen talking alone together in suspicious places. Third is the rash, which arises from a light *conjecture*. . . . [A]lthough the first kind does not have the certainty of something actually sensed, or the certainty of demonstration, it does have the certainty sufficient for proof in law. For the same kind of certainty is not required in all things, as is said in [Aristotle's] *Ethics*, book I, ch. 2 [i.e. ch. 3].[29]

Cajetan, citing both Aquinas and Gerson in a work published in 1525, further entrenches Gerson's term, specifying conditions sufficient for an opinion to be "rationally sufficient for moral certainty [*ratione sufficiente ad moralem certitudinem*]." Taking such opinions to render action permissible, Cajetan lends his support to the probabilist cause.[30]

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[28] T. Deman, art. "Probablisme" in *Dictionnaire de Théologie Catholique*, vol. 13, part 1 (Paris, 1936), col. 431.

[29] Thomas Aquinas, *In IV Sententiarum*, dist. 9, q. 1, art. 5, as translated in James Franklin, "The Ancient Legal Sources of Seventeenth-Century Probability," in Stephen Gaukroger, ed., *The Uses of Antiquity* (Amsterdam: Kluwer, 1991), pp. 136-37.

Suárez, taking issue with Cajetan, includes moral certainty in his own logical space in Disputation 13 when he initiates into the conception of just war the condition that there must be a reasonable chance—but not necessarily a moral certainty—of winning.

> [Cajetan] says that for a war to be just, the Prince ought to know he has enough power to be morally certain of victory. . . . But this condition does not seem to me absolutely necessary. First because in human life it is almost impossible. Secondly because it is often for the common good of the state not to wait upon such certainty, but rather to make the attempt, even when there may be some doubt whether the enemy can be overcome. Thirdly, because otherwise the less powerful king would never be permitted to make war on the more powerful, because the certainty that Cajetan requires could not be achieved. Consequently it should be said that the Prince is indeed required to achieve the maximum certainty of victory that he can; he ought also compare the hope of victory with the danger of harm, and see whether, all things weighed, hope prevails. If he cannot achieve so much certainty, he should at least have a more probable hope of victory, or doubt equally balanced as to defeat or victory, according to the necessity of the state and of the common good. If the probability of hope is less, and the war is aggressive, it should almost always be avoided; if defensive, undertaken, since the former is of choice, the latter of necessity.[31]

And so for many other writers: resolutely facing the difficulty that moral agents often possess only probable knowledge of relevant particular facts, they looked for principles they could use to derive the moral certainty that this or that course of action was permissible. It was left for Descartes to lift their thought from its theological context, to liberate their concept from its link with probability, and to find it a standard for action only because it is a standard for science.

V

In the French version of *Principles* IV, 205, Descartes provides two examples of the morally certain: a hypothesis about a code for interpreting a secret message, and the hypothesis that the rumored city of

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[30] *Summula de peccatis*, cited by Deman, *Dictionnaire*, col. 455.

[31] Francisco Suárez, *Metaphysical Disputations* (1597), Disputation 13, sec. 6.2-3, in *Selections from Three Works* (Oxford: Oxford University Press, 1944), vol. 2, pp. 822-23.

Rome actually exists. It is hard to imagine how he could think the evidence for either hypothesis might render all its observational consequences certain. Descartes here confronts in a new form one of the snags in his original program. If a hypothesis cannot be derived from metaphysical truth, it is likely to be as hard to establish certain truth for the totality of its observational consequences as it would be to establish it for the hypothesis itself. Not only is it possible on the evidence that Rome does not exist; it is also possible that future observation will confirm its nonexistence. I conclude by hazarding some guesses about how Descartes could have thought observation might render all a hypothesis's consequences certain.

Descartes sometimes writes as though it is possible to enumerate all the phenomena a hypothesis must save: "a simple enumeration will make it clear that there is no phenomenon of nature [*naturae phaenomena*] which I have omitted to consider in this treatise."[32] That might have tempted him to think that a person could determine of some hypothesis that it saves all the phenomena.

Again, he might have been tempted by his homely analogy of the clock: given wide enough experience with what a machine *does*, you might think you could predict with certainty what it is *capable of doing*. Making that prediction might seem a good deal more certain than inferring its internal mechanism.

Finally, Descartes suggests in the final paragraph of the *Mediations* that the goodness of God insures that if we are able to make proper use of all our faculties—senses, memory, and intellect—we cannot go wrong about particular things [*res particulares*].[33] That thesis might be harnessed to support the conclusion that six hundred observations certified by memory and intellect suffice to render all of a hypothesis's observational consequences certain.

clock: given wide enough experience with what a machine *does*, you might think you could predict with certainty what it is *capable of doing*. Making that prediction might seem a good deal more certain than inferring its internal mechanism.

Descartes faces a dilemma. If he treats moral certainty as entailing the certainty of all of a hypothesis's observational consequences, then it is hard to see how even six hundred observations could provide it. If he treats it as entailed by any degree of probability short of certainty you may wish to specify, then it is hard to see how it can really be sufficient, on his high standards, either for science or for application to ordinary life.

But one thing is clear. By accepting the first horn of this dilemma—by holding that observation can render certain all of a hypothesis's observational consequences—Descartes devises solutions to each of the theoretical and practical difficulties that had threatened his scientific enterprise from the start. His position is very likely untenable. But the position provides a justification for accepting hypotheses whose truth has not been established. It allows an account of how certainty can be gained when not derivable from metaphysical certainties. And it locates a class of hypotheses which, though not themselves certain to be true, are yet always rational to act upon.[34]

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[32] *Principles* IV, 199.

[33] AT VII, 90: CSM II, 62.

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[34] I am grateful to Fred Feldman, Roger Ariew, and Desmond Clarke for valuable comments, to Edwin Curley and Peter Markie for providing the inspiration, to Daniel Garber for comments in his usual illuminating style on the version of this paper I read to the Central Divison of the American Philosophical Assocation in 1991, and to James Franklin for historical and philosophical insights of all sorts - the kinds we have come to expect of his wiritings in the history of probability.

Part IV
The Cogito

[9]

COGITO ERGO SUM

DESCARTES'S dictum 'I am thinking, therefore I am' looks like an argument, and many philosophers take it to express an enthymeme: whatever is thinking exists, I am thinking, therefore I exist. But this interpretation is vulnerable to objections. Descartes writes: "When someone says 'I am thinking, therefore I am, or I exist', he does not deduce existence from thought by means of a syllogism, but recognizes it as something self-evident by a simple intuition of the mind."[1] Further, Descartes is supposing himself in the grip of an evil demon capable of making him go wrong whenever he computes; but any complex argument is a computation, so, if the cogito is an enthymeme, Descartes cannot rely upon it.[2]

Other problems arise if we construe the cogito as an immediate inference. So taken, the argument is formally invalid: What licenses the inference from 'cogito' to 'sum'? Descartes attempts an answer: he "learns it from experiencing in his own case that it is impossible that he should think without existing" (CSM II 100). But this response appears to take us back to an enthymeme: "It is impossible that I think without existing, I am thinking, therefore, I exist." Also, it repeats without explaining the claim that 'I am thinking' entails 'I am'. (What, one wonders, does Descartes learn from experience in his own case that warrants the inference?) Further, in *The Meditations* Descartes restates the cogito (or something very much like it) in a wholly noninferential form: "So after considering everything very thoroughly, I must finally conclude that this proposition 'I am, I exist' is necessarily true whenever it is put forward by me or conceived by my mind" (CSM II 17). Descartes himself seems unhappy with construing the cogito as an inference.

I believe 'I am thinking, therefore I am' does not express an argument but rather a proposition for which Descartes cannot find an appropriate idiom. He resorts to, then abandons, the language of argument and inference as he shifts about trying to express this deeper truth. I certainly do not deny that an argument can be extracted from the language of the cogito; I believe, however, the

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[1] Second Replies in *The Philosophical Writings of Descartes, Volume II,* John Cottingham, Robert Stoothoff, and Dugald Murdoch, trans. (New York: Cambridge, 1985), p. 100. This will be abbreviated "CSM II" henceforth.

[2] This is worth emphasizing, for it undercuts the position of commentators who maintain that the cogito, while not a classical syllogism, is still a complex argument of a different sort. See, e.g., Bernard Williams, *Descartes: The Project of Pure Enquiry* (London: Penguin, 1978), ch. 3.

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"simple intuition of the mind" discovers something noninferential that justifies the inference from 'cogito' to 'sum', that explains why it is impossible that Descartes should think without existing, as well as why 'I am' is necessarily true whenever he conceives it. In what follows, I shall offer a noninferential reading of 'I am thinking, therefore I am'.[3] What is the deeper truth the cogito expresses?

Let us start with another question: Why does Descartes believe 'I am' is indubitable whenever he conceives it? Also, why is 'I am thinking' indubitable? Plainly, 'I am' and 'I am thinking' are incorrigible for me in the sense that I cannot falsely believe them, but so arguably is 'I am in violent pain now'. Yet the incorrigibility of the first two propositions appears to flow from a different source. Both 'I am' and 'I am thinking' have the feature that, if I stand in any propositional attitude (e.g., doubt, hope, fear, regret) toward them, they must be true. Obviously this is not the case for 'I am in violent pain now'. Further, 'I am' and 'I am thinking' share the interesting feature that they must be true if I stand in a propositional attitude toward *any* proposition. Let us say that proposition *p* is *superincorrigible* for *S* just in case '*S* stands in a propositional attitude toward any proposition' entails *p*. 'I am thinking' and 'I am' are both incorrigible and superincorrigible for me (obviously if *p* is superincorrigible for me, it must be incorrigible for me as well); but 'I am in violent pain' is at best incorrigible for me.

But this does not yet explain the indubitability of 'I am thinking' and 'I am'. For every necessary truth is superincorrigible (hence incorrigible) for me, and many of these are dubitable. The response that 'I am' and 'I am thinking' are *contingent* superincorrigible propositions is unsatisfying, for it explains nothing. Descartes believes 'I am thinking' and 'I am' have some feature that makes their truth especially accessible; their contingency may have something to do with that feature, but it does not reveal it.

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[3] Jaako Hintikka offers a noninferential reading in "Cogito, Ergo Sum: Inference or Performance?" *The Philosophical Review,* LXXI, 1 (1962): 3–32. According to Hintikka, the sentence 'I do not exist' is self-defeating, because anyone who uses it to persuade someone, even himself, of its truth, by so doing, defeats his own purpose. For Hintikka, the cogito marks not an inference but a performance: the indubitability of 'I am' results from the self-defeating nature of trying to think the contrary. For Hintikka, 'I am thinking' does not express a premise; rather "it refers to the 'performance' (to the act of thinking) through which the sentence 'I exist' may be said to verify itself." Several commentators have criticized Hintikka's account of the cogito (see, for example, Margaret Dauler Wilson, *Descartes* (New York: Routledge, 1978), ch. II.) This essay is meant to offer an alternative to Hintikka, not to add to that literature. I shall note only that the fact that a statement or sentence is pragmatically self-defeating hardly entails that it is false: consider G. E. Moore's example: "It is raining and I don't believe it." Consequently, even if thinking 'I do not exist' is self-defeating, as Hintikka maintains, recognizing this cannot establish the indubitability of 'I am'.

Perhaps we can address our problem by asking yet another question: *Why* are 'I am' and 'I am thinking' incorrigible? And why are they superincorrigible? (Their superincorrigibility entails without explaining their incorrigibility, for it needs explaining too.) Necessary truths are incorrigible because they cannot be false, and my attentive belief that I am in pain is incorrigible because there is simply no way for me to be mistaken. But 'I am' and 'I am thinking' are incorrigible for a very different reason: my believing either of these propositions is sufficient to constitute the fact that satisfies its truth condition. This needs explication. What is "constitution"?

A statue is constituted by the lump of bronze out of which it is cast. What does this mean? The statue is nothing more than the lump of bronze; it is not ontologically extra, it is not yet another thing. Given the lump of bronze in that configuration, the statue must exist, and this is *because* the statue just is the lump of bronze in that configuration. Talk about the statue, we might say, is talk about the lump of bronze in different words. Nonetheless, the statue is not identical to the lump of bronze; for one thing, the lump preceded the statue and may survive it. The lump and the statue have different identity conditions. Again, the ninth regiment, which fought in the world war, is constituted by a particular collection of soldiers. The regiment is not something over and above that collection of soldiers. Looking at the soldiers standing at attention on the parade field is looking at the regiment. But the regiment preceded and may survive the collection of soldiers that now constitutes it, so it cannot be identical to the collection.[4]

Similarly, one fact can be constituted by another fact.[5] Fact *A* is the fact that there is at least one circle on this page. Here is circle *D:*

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Fact *B* is the fact that *D* is on this page. The fact that there is at least one circle on this page is nothing more than the fact that *D* is on this page. To use Derek Parfit's phrase, fact *A* is not a "deep further fact"; it is not something over and above fact *B*. Nonetheless, fact *A* is not identical to fact *B*: for if we erased *D* and instantaneously replaced it with another circle somewhere else on the page, *B* would cease to be a fact but *A* would not. Fact *A* is constituted by fact *B*, but it could be constituted by other facts. Now, suppose that we keep *D* and add several other circles as well. Perhaps it would now be wrong to say that fact *A* is constituted by fact *B*. Still it would be true that fact *B* is *sufficient* to constitute fact *A*, for if circle *D* were the only circle on the previous page, fact *B* would constitute fact *A*.[6]

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[4] For more on constitution, see my "Why Potentiality Matters," *The Canadian Journal of Philosophy*, XVII, 4 (December 1987): 815–30.

[5] While I advocate no particular ontological account of facts, perhaps it will be helpful to construe facts as possible states of affairs that actually obtain.

How does this pertain to the propositions 'I am thinking' and 'I am'? Suppose it is a fact that I am thinking: 'This very mental event is a thought'. (Call this fact *F*.) But then it must also be a fact that I am thinking. (Call this fact *G*.) *F* entails *G*, but why?[7] Note that the fact that I am thinking is nothing more than my believing 'This very mental event is a thought'. Nonetheless, *F* is not identical to fact *G*. For if I cease to think 'This very mental event is a thought' but immediately I begin thinking that $2 + 2 = 4$, *G* continues to be a fact but *F* does not. The fact that I am thinking can be constituted by other facts, as the regiment can be constituted by other soldiers. I submit that the argument 'I believe that I think, therefore I think' is valid because the fact expressed by the conclusion is constituted by the fact expressed by the premise.

Right now I believe that I am. Supposing that this were the only fact about me (except the facts that it constitutes), it would constitute the fact of my existence. My existing would be nothing more than my believing that I exist. But the fact that I exist is not identical to the fact that I believe that I exist. For if I cease to believe that I am and instead it becomes a fact that I hope the sun is shining, the fact of my existence would be constituted by this new fact. There are plenty of facts about me right now; nonetheless, the fact that I believe that I exist is sufficient to constitute the fact that I exist. For if it were the only fact about me, it *would* constitute the fact of my existence. The argument 'I believe I exist, therefore I am' is valid because the fact expressed by the premise is sufficient to constitute the fact of my existence. The logical relation between 'I think I exist' and 'I exist' is explained by the ontological relation between the facts these propositions express.

Let us take stock of where we are. I have explained the claim that my believing 'I am thinking' and my believing 'I am' is, for each proposition, sufficient to constitute the fact that satisfies its truth condition. This is why it is impossible for me to believe either proposition falsely. Having explained their incorrigibility, can we explain their superincorrigibility, too? Let us say that a proposition p is *attitude-constituted* for me just in case my standing in a propositional attitude to any proposition is sufficient to constitute the fact that p. 'I am thinking' and 'I exist' are superincorrigible for me because they are attitude-constituted for me. Further, contingent superincorrigibles are so because they are attitude-constituted. (It follows a fortiori that, if I stand in *any* cognitive attitude to the propositions 'I am' or 'I exist', they must be true.) Ultimately, 'I am' and 'I think' are incorrigible because they are attitude-constituted.

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[6] Of course, if *B* constitutes *A*, it follows that *B* is sufficient to constitute *A*.

[7] We are inclined to say that my thinking that I am thinking entails 'There exists an x such that x is a thought and my thinking that I am thinking $= x$' which entails 'There exists an x such that x is a thought'. But note that the first conclusion really is the conclusion we are after, for it involves the claim that there is at least one thought; the inference to this was to be explained.

But not all incorrigible propositions for me are attitude-constituted. Necessary truths like '1 = 1' are incorrigible (and superincorrigible), but it is not the case that my regretting that I have sinned is sufficient to constitute the fact that 1 = 1. The fact that 1 = 1 is something over and above the fact that I regret my sins and even the fact that I believe that 1 = 1. One mark of this is that when fact X is constituted by fact Y, X can be explained by Y. The fact that the regiment is on the field is explained by the fact that the collection of soldiers that constitutes the regiment is there. But the fact that 1 = 1 can in no way be explained by the fact that I believe that 1 = 1; to the contrary, I believe that 1 = 1 because it is a fact. Again, 'I am in pain now' is incorrigible for me; but it is not the case that my believing that I am in pain constitutes the fact that I am in pain. Indeed, the fact that I believe that I am in pain is caused by the fact that I am in pain; the direction of explanation runs counter to that of constitution.

'I am thinking' and 'I exist' are special, then, because they are attitude-constituted; this explains their incorrigibility and their superincorrigibility. It also explains why Descartes believes I have special access to their truth. For as I am acquainted with my own concious mental states, I am acquainted with facts that are sufficient to constitute their truth. If I believe or doubt or hope or regret that I am thinking, this constitutes the fact that I am thinking. If I believe or doubt or hope or regret that I exist, this is sufficient to constitute the fact of my existence; hence the proposition 'I exist' is necessarily true whenever it is conceived by my mind. And if I should go so far as to doubt that I believe or doubt or hope or regret that I exist, this is (a) sufficient to constitute the fact that I exist and (b) sufficient to constitute the fact that I am thinking, which is sufficient to constitute the fact that I exist. My believing an attitude-constituted proposition is sufficient to know its truth because my believing is the fact that constitutes its truth. Doubting that I believe an attitude-constituted proposition is sufficient to know its truth, for doubting that I believe it is sufficient to constitute its truth. Standing in a propositional attitude toward any proposition is sufficient to constitute the truth of an attitude-constituted proposition; hence, where *p* is attitude-constituted, even if I doubt that I doubt that I doubt ad infinitum that *p*, I can never reach a stage that does not constitute its truth.

Now we can explicate the cogito. 'I am thinking therefore I am' means 'My thinking this very thought is sufficient to constitute the fact that I exist'. This proposition is not an argument, for there is no inference; it entails that I exist without asserting that I do. Rather, it expresses a simple intuition of the mind: my existence need be nothing more than my thinking this very thought. That is what Descartes learns from experience in his own case which explains why it is impossible for him to think without existing, why 'cogito' entails 'sum'; it is this particular insight that justifies the general principle 'Whatever thinks exists'. To perceive clearly and distinctly the truth of this proposition is to know that I exist.

Here I want to consider an objection, namely, that the fact that I exist is most certainly a deep further fact, obviously extra to the fact that I believe I exist. Indeed, the fact that I believe that I exist is explained by the fact that I exist: I believe that I exist because I recognize that I do. The direction of explanation runs counter to that of constitution. It is highly paradoxical to maintain that my existing is nothing more than my believing that I exist. What do I believe if the proposition 'I exist' does not express a deep further fact? But if the fact that I exist is ontologically extra to the fact that I am thinking, it cannot be attitude-constituted; consequently, our reading of the cogito must fail.

Remember, however, that Descartes is embarked upon a program of radical doubt: he will reject as false any dubitable belief. If the fact that Descartes exists is indeed a deep further fact substantially underlying and explaining the fact that he thinks (as a substance underlies its attributes), then he has no direct access to it. Hence his belief that he exists is intractably dubitable—perhaps there is no deep further fact—and he must reject it as false. The best Descartes could do to get to 'sum' from 'cogito' would be to introduce a highly dubitable metaphysical premise like 'Thought must inhere in an underlying substance', which would, in any case, turn the cogito into an enthymeme upon which he could not rely. So, if the fact that he exists is extra to the fact that he thinks, Descartes can never get from 'cogito' to 'sum'. Descartes has no choice but to reduce the fact that he exists to an indubitable fact with which he is acquainted: this is the only way he can be certain it obtains.

Let me respond to the question: 'What does the proposition 'I exist' assert if it does not express a deep further fact?' The proposition 'I exist' asserts that there is something that is me. So when I believe that I exist I believe that there is something that is me. (The claim that my existing is nothing more than my believing I exist is simply the claim that there being something that is me is nothing more than my believing there is something that is me.) The proposition that there is something that is me is wholly noncommittal about the nature of that something, whether it is a substance or something reducible to other things or something that only exists because we talk about it, like the Big Dipper. The only constraint is that this something must be able to survive any particular thought. Now, the fact that I am thinking is a very deep fact if I am a very deep thing; hence the fact that I exist, which it constitutes, is itself as thick or as thin as I turn out to be. This is as it should be, for Descartes must establish by honest toil what sort of thing he is. The cogito now becomes: 'There being something that is me need be nothing more than the fact that something is thinking this very thought'.

Now we can simplify our account of the cogito. As we just noted, Descartes has rejected all dubitable beliefs; he is supposing there is no world, that he has no body, and so on. Consequently, there is no fact left to constitute his existence except the attitude-constituted fact that he is thinking; this alone is indubitable. In the context of the program of radical doubt (which is, of course, the context in which it appears), the cogito reads simply: 'My thinking this very thought constitutes the fact that I exist' (or 'My existing is nothing more than my thinking this very thought'). This has an interesting consequence: 'Sum res cogitans' follows directly from the cogito. For if my existing is nothing more than my thinking this very thought, then it follows immediately that I am a thing constituted by the fact of its thinking. Of course, the fact that I exist can survive this particular thought. My existence must be constituted by new facts about my thinking, however; no other facts are left to constitute it. I stop existing when I stop thinking: "thought; this alone is inseparable from me" (CSM II 18). It follows that "I am, then, in the strict sense only a thing that thinks . . ." (CSM II 18).

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[10]

COGITO, ERGO QUIS EST ?

Jaakko HINTIKKA

The problems I am addressing in this paper have been illustrated by the novelist Italo Calvino much better than I could do on my own. The opening scene of one of his novels takes place in the middle ages. Charlemagne is reviewing his troops.

> At every officer he stopped his horse and turned to look him up and down. "And who are you, paladin of France ?"
>
> …
>
> "And you" ? The king had reached a knight entirely in white armor; only a thin black line ran round the seams. "I," came a metallic voice inside the closed helmet, with a slight echo as if it were not a throat but the very armor itself vibrating, "am Agilulf Emo Bertrandin of Guildivern and of the Others of Corbentraz and Sura, Knight of Selimpia Citeriore and Fez !"
>
> "Aha… !" exclaimed Charlemagne… Then he frowned at once. "And why don't you raise your visor and show your face ?"… "I am talking to you, paladin !" insisted Charlemagne. "Why don't you show your face to your king ?"
>
> A voice came clearly through the gorge piece. "Sire, because I do not exist !"

What is going on here, philosophically speaking ? At the first blush, it might perhaps seem that Italo Calvino is a part of a conspiracy designed to disprove my interpretation of Descartes. For it unmistakedly looks just as if Calvino had gone out of his way to construct a counter-example to my performatory reading of the Cartesian *cogito* insight. The starting-point of this way of looking at Descartes' famous *dictum* is to compare the Descartes' self-addressed thought-act of asserting to himself "I don't exists" to someone's public speech-act of declaring, "I don't exist." The operative observa-

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tion is that just as in the second case the speaker will only succeed in demonstrating the opposite of what he asserts (assuming that his hearer understands what he is saying), by the same token, and in the same way, what Descartes manages to demonstrate in the first case is precisely his own existence. The conceptual apparatus of existential inconsistencies, self-defeating utterances etc. was calculated merely to articulate this basic idea.

Now what Calvino (or should I say, Agilulf?) is apparently challenging is the more obvious term of my analogy. If even a successful speech-act does not suffice to justify my belief in the existence of the speaker, how can Descartes' much more elusive thought-act serve the analogous purpose? Seemingly a successful thought-act will not do so if its persuasiveness is derived from an analogy with the persuasiveness of the speech-act. Indeed, one of Janet's depressive patients is on the record of saying to his psychiatrist, "I think, but I do not exist".

Yet Calvino's *prima facie* counter-example to Hintikka — or is it supposed to be a counter-example to Descartes? — is not any more persuasive than the numerous unsuccessful criticisms of my 1962 paper in the professional literature. These criticisms are a sorry lot, and not worth spending much time on. Some critics have tried to cling to the validity of an inference from "I think" to "I exist", blithely ignoring (or being ignorant of) the existence of "free" (presupposition-free) logic where the purported inference fails. (See e.g. Williams 1978, p. 92.) Such free logics show that a purported inference "*b* thinks, therefore *b* exists", more generally, an inference of the form

$$T(b), \text{ hence } (\exists x)(b=x)$$

rests on the tacit assumption, built into conventional logics, that the term *b* is not empty. For Descartes' purposes, an attempted inference of this form is therefore strictly circular.

Other critics have operated with do-it-yourself concepts devoid of any deeper grounding in systematic logical and semantical theory. For instance, one critic relies on the claim that a statement like "I think" presupposes my existence. But a statement or proposition does not presuppose anything, any more than it suspects, wonders, doubts, laughs or weeps, except perhaps metaphorically. It is the success of an utterer that is on some one occasion contingent on certain presuppositions. Hence what my critic ought to have said is that I cannot successfully perform the language act of asserting "I think" without thereby showing that its alleged presupposition, viz . my existence, is satisfied. But this differs only verbally from the leading idea of my interpretation.

Likewise, Calvino's witty skit is not a counter-example to a performatory interpretation of the *cogito*. For Calvino's knight in a white armor fails to exist only in the mundane sense of not enjoying bodily existence. For a logically minded philosopher, he exists in an ever so slightly more abstract and hence more unusual sense than the embodied paladins of France. Agilulf is not an inhabitant of Meinong's jungle of nonexistent objects, or rather is so from the prosaic vantage point of the actual history of the middle ages, but not from the vantage point of the scenario of Calvino's novel. He is on a par with H.G. Wells' invisible man, not with Meinong's round square. In the possible world envisaged by Calvino, he exists as one of its characters as fully as any one of its flesh-and-blood denizens. Indeed, the entire novel is about him, entitled *The Nonexisting Knight*. In a bibliographer's catalogue, Calvino's novel would not be listed as lacking a main character.

In an informed perspective, Calvino's knight with his visor down is on the contrary emulating Descartes. Because he does not enjoy bodily existence, he cannot prove his existence by such means as would convince Dr. Johnson. You cannot kick, touch, or see him. But he could — and he did — thrust himself to the attention of Charlemagne by uttering the same self-defeating Cartesian formula, thus proving in a perfectly good sense his existence to his king. Agilulf does not provide a counter-example to Descartes' insight, he reproduces it.

In sum, I do not see any hope whatsoever of explaining the persuasiveness of the Cartesian *cogito* in any other way than along the lines I have done. Moreover, the performative character of the *cogito* was what made that insight appealing to Descartes. Plenty of evidence to this effect was presented in my 1962 paper. In this respect, I do not see any reason to retract or even to qualify anything in my original paper.

However, this does not fully answer the historical question as to how Descartes tried to incorporate the *cogito* insight in the overall framework of his philosophical system. Other questions than those concerned with the sources of persuasiveness must be raised. First and foremost of them, is the problem that Calvino's knight really embodies — if that is the right word here. This question is not whether a Cartesian thought-act or a Calvinist speech-act does or doesn't convince a witness of the existence of the performer, but the question of who or what the entity is whose existence can be demonstrated in this way. Calvino's ingenious thought-experiment shows that even a successful overt speech-act does not suffice logically speaking to demonstrate the speaker's bodily existence. How can the parallel thought-act then be thought of as demonstrating the thinker's substantive existence as a *res cogitans*? But the contrast between bodily and disembodied existence is not the only dimension in which conceptual differences affect the status of the entity whose existence is purportedly established in the *cogito*. For instance, if an actor playing Hamlet says, *cogito, ergo sum,* he is not proving Hamlet's existence in the real world of his own. However, if his utterance is considered as taking place in Shakespeare's fictional universe, the *res cogitans* who exists there is Hamlet, not the thespian playing a certain role. Hence the real problem here is : What kind of entity is it whose existence Descartes could hope to demonstrate by the *cogito* argument? In brief, the real question here is, *cogito, ergo quis est*? A skeptical answer to this question was proffered by Lichtenberg according to whom the only conclusion Descartes was justified in drawing is *es denkt,* thinking is going on, where the *es* is not a well-defined entity any more than the *es* of *es regnet,* it is raining.

This problem has several different aspects. Descartes used his *cogito* insight for the purpose of moving immediately to his further thesis *sum res cogitans*. Hence one question concerns the nature of Descartes' actual inference (or line of thought) that led him from *cogito ergo sum* to *sum res cogitans*. Another related question concerns the evaluation of the inference. And this evaluation can be done either in terms of the twentieth-century framework which was seen to be unavoidable for the purpose of understanding the appeal of Descartes' thought or else from the vantage point of the Aristotelian framework of concepts and ideas into which Descartes (I will argue) tried to force his argumentation.

The question "So who exists ?" cannot of course be disassociated from the problem of understanding the *cogito* insight itself. As I have pointed out, just as the self-defeating character of saying, "N.N. does not exist", depends on the hearer's being in a position to recognize the speaker as N.N., in the same way the force of Descartes' thought-act "I don't exist" depends on his recognizing the thinker. Now the very criteria of identification (and not only the practical means of identifying an entity) depend crucially on the categorial and other conceptual status of the entity to be identified. There is no entity without identity (i.e. without identity criteria), as Quine has put it. Hence an attempt to understand what really goes on in the alleged *cogito* insight depends crucially on the answer to the question as to what kind of entity it is whose existence is being demonstrated.

Indeed, the weak point of my original reading of the *cogito* was the question of what happens to the presuppositions of a performatory demonstration in the first-person case. If someone says, "Mark Twain doesn't exist", I can recognize the utterance as self-defeating only if I recognize the speaker as Mark Twain. In the case of a self-directed speech-act or thought-act, I will likewise have to recognize the speaker or thinker as — who ? I assumed quietly in my original paper that everyone knows who one is oneself. Yet that recognition depends even in the case of overt performatory utterances on the way in which is referred to. Different modes of reference may entail different criteria of identity, so that a speaker could be identified under some such criteria, but not under others. In this new paper, what I am doing is to dig a little bit deeper into those criteria in the special case of Descartes' reference to himself in the *cogito*.

As I pointed out, the treatment of questions of identity and existence in the *cogito* will inevitably look different from our contemporary point of view from the way they appear from Descartes' semi-scholastic one. What are the main differences between different criteria of identification in the light of state-of-the-art logical and semantical analysis ? Here we come to what probably is the most important insight that has been neglected in recent discussion. (For a discussion of this insight see Hintikka 1989.) The main differences between different methods of identification do not follow the dividing lines between traditional categories or logical types, important though they may be. The most general difference is between what I have called perspectival and public modes of identification. Some cognitive scientists speak of subject-centered and object-centered systems. Others call them, especially in the case of visual cognition, the where-system and the what-system. The basic idea is simple enough.

It can be seen most clearly in the case of visual cognition. In this case, instead of using the public mode of identification that relies on names, social security numbers, dates and places of birth, entries in *Who's Who*, FBI records etc., a subject can instead use his or her own visual space as the framework of identification and treat objects occupying the same slot in one's visual space as identical, even in cases where one does not see who or what is occupying that slot and accordingly when one has to deal with different possible scenarios in which different people or objects have that particular location. One treats the individuals that occupy the same slot in these different scenarios, in the first place the scenarios compatible with everything that one can see at the time, as being identical. A colloquial term for individuals so identified is "visual objects". I have called, and will call, such criteria of identification perspectival.

What is crucial is not only that we can use perspectival criteria of identification, but that we in fact do so when we identify persons, objects, events, places, times, etc. The most common term philosophers are wont to apply to such use of language as is based on perspectival criteria is "indexical reference", but neither this term nor the accompanying diagnosis of the conceptual situation does justice to the facts. We are not dealing with different modes of reference, but with different modes of identification.

On the level of the logical representation of these two different modes of identification is the fact that, since quantifiers presuppose some particular way of (id)entifying their values, we need a distinction between two different pairs of quantifiers in order to represent the two different modes of identification. In earlier papers and books I have explained how they work and how they are manifested in ordinary discourse. (Cf. here Hintikka 1989.) If $(\exists x)$, $(\forall y)$ are quantifiers relying on public criteria of identification and (Ex), (Ay) quantifiers relying on perspectival criteria, then we can say, at least roughly speaking, that the values of the former are ordinary individuals, such as persons and objects publicly identified, while the values of the latter are in the case of visual cognition "visual objects". Of course this terminology does not mean that in any one situation, scenario or "possible world" there exist side by side two kinds of objects, public ones and perspectival ones, as little as in an analogous case public offices and office holders enjoy separate existence ontologically independent of each other. I am not telling you to count persons and objects twice in your ontology. Since the difference is between different modes of identification, it comes into play only when the actual world is considered against a backdrop of other *possibilia,* for instance all the different scenarios compatible with everything someone knows. In other words, since the difference lies only in the mode of identification, it manifests itself only in the cross-identification relations that span the boundaries of different scenarios or worlds. (This incidentally shows that any account of the operation of quantifiers in the sole terms of their "ranging over" a class of values is doomed to be oversimplified.)

I will first use visual cognition as an example and express "a knows that" in the usual way as K_a. (In this case, knowledge is assumed for the sake of explanation to be merely visual.) Then a statement of the form

(1) $(\exists x)K_a(b=x)$

says that *a* can visually place *b* among his or her (or its, if we are dealing with an automation) public objects. This obviously means that *a sees who b is.* In contrast,

(2) $(Ex)K_a(b=x)$

says that *a* can find a slot for *b* among his or her or its visual objects. This clearly means that *a sees* (knowingly) *b,* i.e. sees *b as b.* Possibly unknowing seeing can be expressed by

(3) $(Ex)(x=b \;\&\; K_a(x=x))$

What has just been said of visual cognition is easily generalized to other epistemic notions. So generalized my analysis reveals the logic of their direct-object constructions. Another instructive example of the general distinctions and observations made above is offered by memory-knowledge. There the logical distinction between perspectival and public identification is manifested in the form of Endel Tulving's well-known contrast between episodic and semantic memory. A philosophical incarnation of the distinction can be said to be Russell's contrast between objects of acquaintance and objects of description, even though Russell did not realize that the distinction is between different modes of identification and consequently reified the two into two parallel classes of entities.

The most important conceptual problem concerning the two kinds of identification has so far received little overt attention from philosophers. It is the question how the innumerable local identificatory frameworks supporting perspectival identification are as it were integrated into parts of one and the same global (i.e. public) framework. The current status of this problem is like that of Augustine's problem of the nature of time. As long as you do not raise the question, everything appears clear. Once you raise the question, you can scarcely fail to see its complexity and intricacy. It presents a major untreated problem for serious contemporary philosophical thought.

Another way in which perspectival identification manifests itself in ordinary language is in the form of indexical words like "this", "that", "now", "here", and "I". Their semantical peculiarity lies in the fact that they serve to pick out a perspectivally well-defined individual. In statements like

(4) This street is Commonwealth Avenue

(5) It is now six o'clock

an identification is made between a perspectivally identified and publicly identified entity. In a statement like

(6) I., N.N., solemnly swear…

the point likewise is to ensure that the perspectival person present and performing an act of oath-taking actually is N.N., the publicly identified individual.

Now I am in a position to answer the question, "Whose existence is supposed to be proved in the *cogito*?", from the vantage point of up-to-date logical and semantical theory. In order for a speech-act to convince me of the speaker's actual existence, I must be present at the performance. I must be an eyewitness, "earwitness" or thought-witness (introspective witness) to the performance. The speaker and his or her act must be objects of acquaintance, to use Russell's jargon. Moreover, in order to be convinced of the speaker's present existence, the speech-act must be a contemporary one. All these requirements can be summed up in saying that the speaker must be one of my perspectivally identified objects at the time of the speech-act.

All this can *mutatis mutandis* be extended to Descartes' knowledge of his own thought-act. In it, René must be directly witnessing the thought-act of his *alter ego* Cartesius. He has to be himself one of his objects of acquaintance in Russell's sense, that is, a perspectivally identified entity. In practice, this direct witnessing is but a form of introspection. Hence the interpreters who have emphasized the role of introspection and introspective awareness in Descartes have been up to something important.

The conclusion from all of this for my central question is now clear. *The* cogito *can only demonstrate the existence of a perspectivally individuated entity,* not a publicly identified one. The entity whose existence is the issue in the *cogito* is an object of acquaintance rather than an object of description. This is the source of the logical and other conceptual peculiarities of the *cogito.* The perspectival character of the entity whose existence is at ussue is among other things signalled by Descartes' use of the indexical "I". For the first-person pronoun "I" is an archetypal vehicle of perspectival (indexical) reference, denoting as it does the origo (as it were) of one's perspectival coordinate system. Descartes is not for nothing formulating his insight in first-person terms: *I* think, therefore *I* exist. As soon as you try to reformulate the *cogito* in third-person terms, you will see its plausibility disappear. Indeed, I once saw a French cartoon whose whole point was the ridiculousness of the pseudo-*cogito* "I think, therefore Cartesius exist". What is especially telling here, the ridiculousness persists even if I put those words into Descartes' own mouth.

Thus, I might say, Lichtenberg was only slightly inaccurate in his criticisms. Instead of concluding merely "es denkt", Descartes (and Lichtenberg) could have concluded (pointing), "(dies)es denkt". And if you don't feel tempted to think that an indexical like "this" or "dieses" is so sufficiently like a name that it can identify its object, it may be salutary to recall that one of his earlier semantical sins that Wittgenstein later confessed was to "propose to ourselves to give the aspects 'this' and 'that' names, say A and B." (*The Brown Book,* pp. 171-172.) The young Wittgenstein's seducer was in this case undoubtedly Bertrand Russell for whom "this", "that" and "I" were the only "logically proper names" of English, meaning the only proper names of objects of acquaintance.

The tie between the *cogito* and the first person is not completely inseparable, however. The second-person pronoun "you" can be used (at least in its simplest kinds of employment) only if the speaker confronts directly the addressee. This means that "you" relies on perspectival identification, too. And, not surprisingly, it can serve as a medium of a kind of *Ersatz cogito.* You only need to imagine Descartes saying mentally to Cartesius with an intonation of surprise, "you are thinking, hence you must exist". The result is to all practical purposes but a notational variant of the *cogito* insight.

Another aspect of the same perspectival character of the *cogito* is that the evidence provided by the *cogito* must be restricted — or so it seemed to Descartes — to the present moment. As he puts it in the *Discours*:

> ...if I had merely ceased thinking, even if everything else I had ever imagined to be true, I should have had no reason to believe that I existed. (Cottingham *et al.*, vol. I, p. 127.)

We are here in a position to understand Descartes' way of thinking. The reason for the momentary character of the *cogito* is that its object is a perspectival one. And, as was seen, the reason is that perspectival identification presupposes direct witnessing which seems to be a momentary affair. Accordingly, the *cogito* carries according to Descartes conviction only about the present moment.

For all these reasons, the Cartesian *cogito* scarcely cannot support any inference to the existence of a public object, let alone a substance. In so far as the *res* in Descartes' formula *sum res cogitans* is supposed to be a *res publica,* this alleged conclusion just does not follow from the *cogito.*

As a fringe benefit of these observations, we obtain an interesting sidelight on the relation of Descartes to that Cartesius *redivivus,* Edmund Husserl. There is a close relationship, if not a complete identity, between the notions of perspectival individual and phenomenological object. This relationship has been suggested, albeit not investigated in depth, in Hintikka (forthcoming c). The fact that his primary insight applies only to a perspectival individual, the I, aligns Descartes firmly with the phenomenological tradition in philosophy.

Here my contemporary line of thought might seem to have left poor Descartes hopelessly behind. Since Descartes thought that he had proved by the *cogito* the existence of a substance, he could scarcely have restricted his existence claims to those concerning merely perspectival entities, to the mental counterparts of mere visual objects. Surely this is not what Descartes was actually thinking, I hear you say to yourself. And if my interpretation does not even enable us to understand, let alone validate, the first and foremost conclusion from the *cogito*, how can I claim so much as be speaking of the same thing as Descartes ?

A good part of an answer is that Descartes clearly was painfully (or blissfully) aware of the restriction of the *cogito* to a single moment of time and to have tried to overcome this limitation. Although we are not dealing with the *cogito* any longer, the main point is so crucial to Descartes' thought that it is worth reminding the reader about. Descartes' way out of temporal solipsism is by proving the existence of a god who guarantees the persistence of truths in time. The details do not need to concern us here. The crucial fact is Descartes' unmistakable awareness that his *cogito* insight is temporally restricted precisely in the way I have shown to follow from the logic of the *cogito* — at least on the other assumptions Descartes made. Without this awareness, he would not have had a motive of looking for a god that could miraculously turn perspectival objects into public ones. We might thus say that a proof of God's existence was the basis Descartes' attempt to deal with the integration problem explained earlier. In particular, Descartes could consistently think that the thesis *sum res cogitans* is a momentary insight in the same way as the *cogito* itself, waiting to be turned into a permanent theorem literally by the grace of god. An interpretation of Descartes along these lines fits in well with the interpretation of the so-called Cartesian circle as involving a quest of *deus ex tempore* to turn Descartes' original momentary insights into temporally stable truths. Such an interpretation is persuasively presented in Etchemendy (1981).

But this logico-semantical analysis of the question *cogito, ergo quis est* does not tell the whole story of Descartes' own way of dealing with the problem of his own existence and nature or with the problem of existence in general. Here I in fact come to a point where I have to amplify in certain respects what I said in the 1962 paper. What was said there may have been truth and nothing but the truth, but it was not the whole truth about the *cogito*. I did not then fully grasp how deeply Descartes was entrenched in the ways of thinking of his teachers and predecessors all the way back to Aristotle. I fully believe that Descartes grasped the performatory sources of the persuasiveness of the *cogito*. But even so, he somehow had to try to accommodate the *cogito* insight within the inherited scholastic and

Aristotelian framework. This prompts a number of questions, including the following: What is the place of the *cogito* according to Descartes in an Aristotelian conception of a syllogistically organized science? Can it be accommodated in such a conception? How can the inference to *sum res cogitans* be accommodated in an Aristotelian science? This prompts the more general question: How is existence treated in the Aristotelian syllogistic framework, anyway?

These questions are quite pressing. The Aristotelian framework is in fact not very far from Descartes' mind. It can be shown that even in the passages that seem to disassociate the *cogito* most sharply from syllogistic reasoning, Descartes has in the back of his mind the Aristotelian syllogistic model of science. For instance, in his replies to the second set of objections, Descartes writes:

> Now awareness of first principles is not normally called science by dialecticians. And when we become aware that we are thinking things, this is a primary notion which is not derived by means of any syllogism. When someone says, 'I am tinking, therefore I am, or exist,' *he does not deduce existence from thought by a syllogism, but, recognizes it as something self-evident by a simple intuition of the mind* [emphasis added]. This is clear from the fact that if he were deducing it by means of a syllogism he would have to have had previous knowledge of the major premise, 'Everything which thinks is, or exists'; yet in fact he learns it from experiencing it in his own case that it is impossible that he should think without existing. It is the nature of our mind to construct general propositions on the basis of our knowledge of particular ones. (Cottingham et al., vol. II, p. 100.)

This passage shows several things. First, Descartes is not departing at all from the Aristotelian model when he says that in the *cogito* he is not deducing existence from thinking as in a syllogism. The reason he gives is that the *cogito* is a primitive truth. Now the first principles of a science were not deduced syllogistically according to Aristotle, either, but arrived at dialectically. Hence Aristotle and Descartes agree in this regard completely. Furthermore, the quoted passage, especially the last sentence, shows that the output of the *cogito* insight is after all calculated to be a general truth, to all practical purposes a syllogistic premise, and an immediate premise at that. The emphasis on one particular case, viz. one's own, simply pertains to the way in which the general truth in question comes to be known. It pertains to the presyllogistic and dialectical stage of a scientist's argumentation. Hence Descartes is clearly trying to accommodate the *cogito* insight in a traditional Aristotelian framework of syllogistically interrelated general truths.

This leads to the question as to how existence claims were handled in an Aristotelian science and how they were related to the notion of essence. There is in fact available a simple and illuminating answer available to this question, although it surprisingly is not found in the literature, except for a few earlier papers of mine. The problem is partly due to the fact that Aristotle has no single way of expressing existence, except for the absolute construction with the Greek verb *estin*, as in "Zeus *is*" or "Homer *is*". What is more striking but less fully appreciated is the fact that in Aristotle there is nothing like the Frege-Russell assumption that words like *is* or *estin* are ambiguous between the *is*es of existence, identity, predication and subsumption. Indeed, I have shown that the Frege-Russell ambiguity thesis is incompatible with Aristotle's treatment of being in the *Metaphysics*. (See Hintikka, forthcoming a.)

In Aristotelian syllogistic premises and conclusions, too, what for us would be the existential and the predicative senses of being are inextricably intertwined. But there is an interesting difference as to how syllogistic necessity and existence move in a chain of syllogisms. Consider, as a representative example, the following *barbara* syllogism:

$$\begin{array}{lll} (7) & & \text{every B is A} \\ & & \underline{\text{every C is B}} \\ & \text{ergo:} & \text{every C is A} \end{array}$$

In it, the connection between C and A is established by inserting a middle term B between C and A. The most basic ("atomic") premises are hence the ones in which the step from the so-called (e.g. C in "every C is B") to the so-called predicate term (e.g. B) is minimal. Accordingly, Aristotle recognizes such atomic premises as a separate class of the ultimate assumptions of a science.

Yet it is not the only class, as it would be on a simple-minded traditional syllogistic conception of logical inference. In order to understand what the others are, we have to see how existence assumptions fare in a syllogism like (7). It is not hard to see what Aristotle thinks about this matter. According to him, the existential force trickles down from the predicate term of the major premise to the minor term. In fact, Aristotle makes it clear that according to him existence, too, is proved by means of a middle term. (See *An. Post.* B 2, 90a 6-14.) In other words, a fuller form of (7) might thus be something like this:

(8) every B is A (and thus *is*)
every C is B
ergo: every C is A (and thus *is*)

Even though quasi-syllogisms like (8) are never formulated in so many words by Aristotle, the logic they instantiate is clearly presupposed in *An. Post.* B 2. The fact that they are not countenanced by him as a separate class of inferences is probably due to the fact that the allegedly different Frege-Russell senses of being in (7) cannot be strictly told apart according to Aristotle. (Cf. Hintikka, forthcoming a.) Syllogisms like (8) can so to speak still exist in Aristotle as components of (7).

The quasi-syllogism (8) shows that according to Aristotle we have to impute an existential force only to the *is* of the major premise. In an Aristotelian science, the only existential assumption needed is therefore the assumption that the genus of that science exists, which is precisely what Aristotle says of a class of ultimate assumptions needed in any one science but different from atomic premises. (See *An. Post.* A 10, 76a 12-15.) But what precisely does Aristotle say of a double-duty syllogism like (8)? In it, the middle term B is said to be the *essence* (or a part of the essence) of the minor term C. This is a consequence of the syllogism's being an atomic (minimal) one, which makes B the best available answer to the question: What are the C's? Furthermore, B is said to be the *cause* of C. Why? Here the role of existence presuppositions in (8) becomes crucial. The middle term B is the cause of C, because it is in virtue of this term that the C's are, i.e. exist. It serves so to speak to transmit existence from the major term to the minor. What could be a better reason for calling it a cause of C?

Whether or not it is a better reason, on the performatory interpretation my thinking is a cause of my existence in an altogether different sense. By performing an act or activity of thinking, I create or maintain the kind of existence that can be directly recognized. In contrast, the Aristotelian notion of cause is a much less dynamic one, in typical cases a formal or final cause rather than an efficient one.

The Aristotelian schema is directly applicable to Descartes' inference after he has converted the intuitive insight concerning a particular case into a general premise, as he indicated that we can do. (See above.) Then the quasi-syllogism in question will then look like this :

(9) everybody who thinks, exists
I think

ergo : I exist

This inference is on a par with the existential part of the inference (8). In it, thinking plays the role of the Aristotelian middle term. According to what was found above about Aristotle's way of thinking, it is hence the cause of my existence in the Aristotelian schema, too, although in a manner entirely different from the performatory sustenance of my existence on the modern view. What is especially relevant here is that according to the Aristotelian principles the middle term is the essence, or part of the essence, of the minor. Putting all these observations together, we can thus see that, in so far as Descartes was assuming the traditional schema, he was merely a faithful follower of Aristotle when he moved from his *cogito* insight into the thesis *sum res cogitans*. This transition does not presuppose any superior introspective insight. On the Aristotelian model it merely requires that the inference (9) be an atomic one, that is, as simple and basic as it can be in the syllogistic structure of science. And this basic role of his *cogito* Descartes was prepared to defend tooth and nail.

In general, practically the only thing Descartes needs to do to make his line of thought compatible with the Aristotelian conception of science is to show that the ingredients of the *cogito*, considered as an inference, can be considered atomic premises in Aristotle's sense. Earlier it was seen that this implies that we must come to know the quasi-premises of the *cogito* by a method other than syllogistic inference. Now it is seen that the role of the *cogito* as an atomic inference justifies for an Aristotelian Descartes' step to the thesis that his essence is thinking.

What has been found here is a nice illustration of the complexities and subtleties of the history of philosophy. It was seen that, when we come to understand precisely what is involved in the Aristotelian treatment of existence, we also see that Descartes' statements about the *cogito* mesh perfectly with that Aristotelian framework. The very same passages, like the one quoted above from Descartes' second set of replies to objections, in which he seems to evoke the performatory character of the *cogito*, can even on the most literal reading be taken to conform to the Aristotelian model. This fact is nevertheless compatible with the deeper insight that the epistemic appeal of the Cartesian *cogito* is entirely due to its performative character. It is even compatible with Descartes' having been aware of this source of the epistemological force of the *cogito*. I have gone as far as to point out the Descartes was keenly aware of the limitations to the *cogito* insight that ensue from its performatory character. A major ingredient of his philosophical system, viz. his appeal to God's existence and goodness for the purpose of backing up the permanence of the *cogito* insight and its consequences, was but an attempt to overcome the limitations ensuing from the performatory character of the *cogito*.

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REFERENCES

ARISTOTLE, *Posterior Analytics*, translated with a commentary by Jonathan Barnes, second ed., Clarendon Press, Oxford, 1994.

CALVINO, Italo, *The Nonexisting Knight & The Cloven Viscount*, Harcourt Brace Jovanovich, New York and London, 1977.

The Philosophical Writings of Descartes I-II, translated by J. COTTINGHAM, R. STOOTHOFF and Dugald MURDOCH, Cambridge University Press, 1985.

ETCHEMENDY, John, "The Cartesian Circle : Circulus ex tempore", *Studia Cartesiana* vol. 2 (1981), pp. 5-42.

HINTIKKA, Jaakko, "*Cogito ergo sum :* Inference or Performance ?", *Philosophical Review* vol. 71 (1962), pp. 3-32.

HINTIKKA, Jaakko, "The Cartesian *cogito*, Epistemic Logic and Neuroscience : Some Surprising Interrelations", in Jaakko HINTIKKA and Merrill B. HINTIKKA, *The Logic of Epistemology and the Epistemology of Logic*, Kluwer Academic, Dordrecht, 1989, pp. 113-136.

HINTIKKA, Jaakko, "The Idea of Metaphysics in Aristotle's *Metaphysics* Gamma" (forthcoming a).

HINTIKKA, Jaakko, "On the Development of Aristotle's Ideas of Scientific Method and the Structure of Science" (forthcoming b).

HINTIKKA, Jaakko, "The Idea of Phenomenology in Wittgenstein and Husserl" (forthcoming c).

WILLIAMS, Bernard, *Descartes : The Project of Pure Enquiry*, Humanities Press, Atlantic Highlands, N.J., 1978.

Part V
Ideas, Truth, Judgement

HISTORY OF PHILOSOPHY QUARTERLY
Volume 12, Number 2, April 1995

HOW CAN WHAT I PERCEIVE BE TRUE?

Russell Wahl

AT the beginning of the Third Meditation, Descartes suggested the following "general rule:" "Whatever I perceive very clearly and distinctly is true." He adopts this truth rule in the fourth Meditation, and most people would hold that it is central to Cartesian philosophy. In this paper the focus is not on Descartes' justification of this principle, but on what he could mean by saying that the object of a perception is true. While Descartes uses the word "true" in a variety of senses, this truth rule is best understood in terms of a perception of what Descartes sometimes calls a "true and immutable nature," and not of a proposition.

The truth rule has rightly troubled many philosophers. On first reading, it may seem as though Descartes is suggesting that there are propositions somehow before the mind's eye, some appear dimmer than others, some very bright. Those which we see clearly and distinctly are the true ones, those which we cannot, false.

There is a passage at the beginning of the Third Meditation which suggests that if this is Descartes' rule, then it should have been radically rethought. There Descartes made a sharp distinction between the faculty of understanding and that of judgement. The understanding is the realm of ideas, the perceptions of the mind. Judgement, on the other hand, involves the will assenting to what is before the mind. In the third Meditation Descartes stated that formal falsity (and so presumably truth) "can only occur in judgements" (AT VII 37, 43; CSM II 26, 30).[1] Here judgements are contrasted not only with ideas, but also with the will and the emotions. Setting these last two aside and focusing on the distinction between a judgement and an idea, it looks as though the distinction Descartes was making is the same kind of distinction which is commonly made between a proposition and a term, since it is commonly held that only propositions, as opposed to terms, can be said to be either true or false. On this reading, Descartes is taken to have held a position like this:

> A. Ideas (perceptions of the understanding) are of the ontological counterparts of terms. Judgements, by contrast, always involve the assertion of a proposition, and only these may be either true or false.

According to position A, propositions are the only things which can be true or false, and they and only they are the objects of judgements. Ideas or perceptions of the understanding, on the other hand, are always of individual terms, which, while they may be complex, are not articulate, and thus unable to have a truth value.

There is some support for the view that Descartes held position A. In addition to the passage in the third Meditation given above, he generally gives as examples of ideas his idea of himself, of God, of extension, etc. These are not the sorts of things to which we ascribe a truth value. When opening his discussion of ideas in the third Meditation, he states that "some of my thoughts are as it were the images of things [*tanquam rerum imagines sunt*], and it is only in these cases that the term "idea" is strictly appropriate..." (CSM II, 25; AT VII, 37). Images or pictures are not the kind of thing that can be true or false.

According to Position A no object of perception could be true or false, and thus Descartes' rule that "whatever I perceive very clearly and distinctly is true" has to be seen as an aberration. But the presence of this rule not just in this passage, but later in the *Meditations* as well as in the *Discourse on the Method*, suggests that, however tempted we might be, we should resist ascribing Position A to Descartes. This rule and other passages[2] suggest that Descartes held that in some sense what is true could be an object of perception (of the understanding) as well as of judgement, contrary to position A.

If we look closely at the passage from the third Meditation which appeared to support position A, we can see that it does not. Descartes said that ideas cannot "strictly speaking" be false, "provided they are considered solely in themselves and I do not refer them to anything else" (CSM II, 26, AT VII, 37). Thus error occurs only when I judge things to be a certain way, and "the most common mistake which is to be found here consists in my judging that the ideas which are in me resemble, or conform to, things located outside me" (*loc. cit.*). This kind of judging is then contrasted with considering ideas "simply as modes of my thought." The concern with "formal falsity" thus appears to involve the operations of the mind, and not the objects of those operations. That among operations of the mind only judgements yield error does not conflict with what Descartes says about the truth or falsity of the objects of perception.

If we focus on the passages in the fourth and fifth Meditations where Descartes talked about the objects of clear and distinct perceptions being true, rather than the passages which contrast ideas with judgements, we might reject A in favor of a position which broadens the class of those things which can be perceived:

> B. Some of the objects we perceive (with the understanding) are propositions, and these can be either true or false. When we have a clear and distinct perception of a proposition, the proposition is true. If we judge true only those propositions which are clearly and distinctly perceived, we shall be acting correctly.

There are several passages in the fourth Meditation which could be taken as support for this position, and this is a position which has been quite attractive to many contemporary commentators, such as Bernard Williams[3] and Margaret Wilson.[4] These commentators recognize that Descartes thinks we can have ideas or perceptions of what is true, and since (they argue) only propositions could fit this bill, Descartes' concern when discussing the truth of what is clearly and distinctly perceived must be with propositions. First Williams:

> But if this is his meaning, his usage of the term "idea" must cover more than he has, in the *Meditations*, so far recognized. For ideas have been introduced as ideas of (possible or actual) things,... it makes no sense to say that one can assent to a thing, or to the idea of a thing. I can assent only to something of the nature of a proposition.[5]

And Wilson:

> Now previously he has said that ideas are like images of thing, and as such neither true nor false. But clearly, what we affirm or deny are not "images of things" but propositions or propositional contents - and these are true or false independently of our affirmations or denials.[6]

A supporter of position B can (as Williams does[7]) recognize that the passages used to support position A concerned the ideas considered as modes of our minds, and did not exclude the possibility that their objects may be the sorts of things that can be true or false. Propositions, then, are admitted as objects of perception, and they can be either true or false. After making this move, both Williams and Wilson, when discussing Descartes' notion of clearly and distinctly perceiving X, assume that X is a proposition.

Supporters of this position may look to such passages as the following, from the *Discourse on Method*, where Descartes introduces his truth rule in the following way:

> After this I considered in general what is required of a proposition in order for it to be true and certain [*ce qui est requis à une proposition pour être vraie et certaine*].... I observed nothing at all in the proposition *"I am thinking, therefore I exist"* to assure me that I am speaking the truth, except that I see very clearly that in order to think it is necessary to exist [*sinon que je vois très clairement que, pour pense, il faut être*]. So I decided that I could take it as a general rule that the things we conceive very clearly and very distinctly are all true [*les choses que nous concevons fort clairement et fort distinctement sont toutes vraies*]... [CSM I, 127; AT VI, 33].

Here Descartes appears to be primarily concerned with determining when a proposition is "true and certain," and on at least one way of reading this he might be seen as saying that we conceive the proposition very clearly and distinctly, and it is therefore true.

But there are difficulties with position B. Descartes thinks of a mental perception of X as having X before one's mind. But if "whatever I perceive very clearly and distinctly is true," Descartes would be committed to the view that we could clearly perceive only true propositions. But it is hard to see how he could have thought this if clearly perceiving X is simply having X clearly before one's mind.

That is, it is hard to maintain that I can very clearly and distinctly understand (perceive with the understanding) the proposition p, but not be able to understand not-p. Perhaps the case is even stronger when what I am perceiving is the proposition, say, not-q.

A second difficulty, which is discussed by Margaret Wilson,[8] is that if, when I perceive p clearly and distinctly, I perceive that p is true, there seems to be nothing left for the faculty of judgement to do.

There is a further reason why we should be cautious about position B. B explains all reference to "clearly and distinctly perceiving X" in terms where X is taken to be a proposition. But it is very hard to maintain that Descartes always thought of clear and distinct perception as being of propositions. The motivation for this move was that it is hard to see how anything except a proposition could be true or false, and that there are some passages in which the objects of perception (e.g. self-evident truths, common notions, etc.[9]) under discussion are clearly propositional.

But while many contemporary commentators find it hard to call objects true or false, it does not appear to have been so hard for Descartes. In his Replies to the Fourth Set of Objections (by Arnauld), for example, Descartes referred to the truth or falsity of objects,[10] and in the first Meditation, Descartes appears to equate "true" with "real" or "having being" (AT VII, 20; this is masked by Cottingham's translation CSM II, 13). In a late letter to Clerselier, 23 April 1649, Descartes equates the truth of the object of an idea with its being real, or including being: "Truth consists in being and falsehood only in non-being" (CSMK III, 377, AT V 356). Descartes often makes reference to "true and immutable natures" (e.g. in Meditation V, CSM II, 44, AT VII, 64), which certainly suggests that Descartes is not restricting his use of the word "true" as modern commentators would. Here it should be stressed that in this sense of "true" what is true is the *object* before the mind and not the idea — not the operation of the mind, but what is perceived. This sense of "true" is certainly tied to the doctrine that what we perceive very clearly and distinctly is true.

All of this suggests that instead of altering position A to enlarge the class of things perceived, it is better to enlarge the class of items which can be called true, and interpret Descartes' assertion that what we perceive very clearly and distinctly is true (the truth rule), not in terms of perceiving propositions, but in terms of perceiving (having ideas of) natures which are genuine or real.[11]

Let us propose the following position:

> C. The objects of our ideas (or perceptions) can be either true or real on the one hand, or less real, even false, on the other.[12] If we confine ourselves simply to understanding, we shall not be in error; but if we judge when we do not perceive clearly, then we may make a mistake about what we perceive. However, when we perceive something clearly and distinctly, we are aware of something true and real. We may then affirm that it is real and base judgements on this perception which will be true.

This position is closer to Descartes' view than either of the other positions. Nevertheless, there are certain difficulties with thinking of this position as a full account of Descartes' doctrine that what is perceived very clearly and distinctly is true.

One point that should be emphasized is that Descartes does not mean that when "what I perceive" is true, that what I perceive must be an existing external object. One might think this is the case when Descartes cautions us in the third Meditation that "the chief and most common mistake which is to be found here consists in my judging that the ideas which are in me resemble or conform to the things located outside me" (CSM II, 26; AT VII, 37). It might seem from this that Descartes' account of a true idea is simply that it is an idea whose object is an existing object. But this cannot be Descartes' view, for if it were simply the case that what I perceive clearly and distinctly exists outside me, there would be no need for the proof in the sixth Meditation for the existence of extended substance. Descartes is especially clear on this point in a letter to Mersenne (March 1642, CSMK III, 211, AT III, 545):

> ...you quote as an axiom of mine; whatever we clearly conceive is or exists. That is not at all what I think, but only that whatever we perceive clearly is true, and so it exists if we perceive that it cannot not exist; or that it can exist, if we perceive that its existence is possible.

Here Descartes appears to identify what is clearly and distinctly perceived (and so what is true) with what can exist, or is possible. And this point is also suggested by the discussion in the fifth Meditation (CSM II, 44-5, AT VII, 64), where Descartes gave as an example of a clear and distinct perception, that of a triangle, which he said has a true and immutable nature, although he does not think it follows that a triangle exists, albeit that, by what he said in the Replies to the Second Objections (CSM II, 117, AT VII, 166), it can exist.

The above quotation is a puzzle for those who would understand Descartes along the lines of position B above, understanding clear and distinct perception as perception of propositions. For the object of these perceptions appears to be some sort of thing which we could then assert exists. However, the quotation also illustrates a problem with position C, if position C is understood as excluding propositions as objects of perception. For in this letter, as in many places in the *Meditations*, Descartes moves from perception of a thing to the perception *that the thing cannot not exist*, or *that its existence is possible*. This sort of talk suggests that Descartes did think that among the objects of the mind's perception are propositions.

If we think of propositions as abstract entities, as the objective counterparts of sentences, it is a mistake to attribute such a position to Descartes. Such a position violates the nominalist tone of Descartes' philosophy, but more to the point, it involves propositions, both true and false, as objects of the understanding. Descartes' view could at most involve true propositions. When Bertrand Russell abandoned his claim that there are false propositions, he correctly saw that he no longer had a theory of propositions as objects of mental attitudes, but rather a theory of facts as such objects. While we might (on the basis of some texts which assert that we perceive clearly "what we affirm," or that such and such is the case) attribute to Descartes the view that we can clearly perceive true propositions and see that they are true, we certainly cannot attribute to him the view that we can clearly examine false propositions and see that they are false. Thus it would be a mistake to see modern-day propositions as objects of perception.

But this should not be taken as a denial that Descartes' ideas have what we might call *propositional content*.[13] In fact, the dichotomy between ideas and propositions, so pronounced in position A, given above, is quite alien to Descartes. While it is true that Descartes said in the third Meditation that ideas are "as it were images of things [*tanquam rerum imagines*]" (CSM II, 25, AT VII, 37), he does not think of ideas as ordinary pictures, which is his view of what might occur in the corporeal imagination. In a letter to Mersenne of July 1641, he denies this is the correct view of ideas:

> For by "idea" I do not just mean the images depicted in the imagination, indeed, in so far as these images are in the corporeal fancy, I do not use that term for them at all. Instead, by the term "idea" I mean in general everything which is in our mind when we conceive something, no matter how we conceive it. (CSMK III, 185, AT III, 392-3).

When Descartes says that ideas are *tanquam rerum imagines*, he is saying they are "like images" in that they exhibit things to us; he is not saying that they are like pictures in contrast to a conception of a thing which would include a propositional content. If we think of the idea of a triangle the way later empiricists thought of it as something like a little picture of a triangle, it will be hard to make sense of the claim that what we are perceiving is true. It will also be hard to make sense of such claims as that we can perceive properties such as having the angles add up to two right angles when considering (perceiving, or having an idea of) a triangle. But this is the sort of claim Descartes routinely makes. There doesn't appear to be a sharp difference between this and perceiving that the angles of a triangle add up to two right angles. In fact, Descartes does not seem concerned to make a distinction between ideas which can be expressed by simple terms or by propositions. When Mersenne suggested that this may be the distinction between an idea in the imagination and an idea in the mind, Descartes responded (in the same letter as above):

> It is not whether they are expressed by terms or propositions which makes them belong to the mind or the imagination; they can both be expressed either way....

The fact that in the *Meditations* Descartes stated the truth rule in terms of what the mind clearly and distinctly *perceives*, but in this letter to Mersenne (contemporary with the *Meditations*) and in the formulation of the truth rule in the *Discourse on the Method* he used the term "conceive," should also indicate that Descartes did not draw a hard and fast distinction between what the mind perceives and what it conceives, a distinction which was quite important to later empiricists.

When Descartes said that what we perceive is true, we should take this to be true in the sense of being real or genuine, as suggested by position C. With these natures before the mind, we may then consider propositions concerning them. If these are based on such true natures, the propositions will be true. Descartes said very little about this move from the nature to the proposition, except, again, in this letter to Mersenne, where he said (while discussing the idea of God as opposed to the proposition *that God exists*),

> It is true that the simple consideration of such a Being [God] leads us so easily to the knowledge of His existence that it is almost the same thing to conceive God and to conceive that He exists; but nonetheless the idea we have of God as a supremely perfect being is quite different from the proposition "God exists," so that the one can serve as a means or premise [*antécédent*] to prove the other. (CSMK III, 186, AT III, 396).

So when Descartes says that we perceive that a proposition is true, we should understand this perception to be parasitic on perceptions of essences or natures. What we have before our minds when we consider propositions are, initially, natures. This way of seeing things accounts for why, although I can equally well understand the propositions "God exists" and "material substance exists," the understanding (having just considered the natures in question by the fifth Meditation) will license me to affirm the first, but not the second. The first is based on the perception of the true and immutable nature of God, which contains actual and eternal existence. When I examine the nature of extended substance, though, I perceive only possible existence contained therein.

This proposal appears to give the correct result, at least as far as the fifth Meditation discussion of God and extended substance is concerned. If we look at the passage from the *Discourse* where Descartes introduced the truth rule with an apparent reference to propositions, we shall see that what he says he clearly and distinctly perceives (or conceives) is not the proposition "I think, therefore I am," but *that in order to think it is necessary to exist*. What he perceives here has propositional content, but we should not conclude that he has the view that true propositions are those which are perceived very clearly. What he has perceived very clearly and distinctly is a connection between thinking and existing.

In the *Meditations*, though, Descartes phrases this point somewhat differently. There he stated that in his first item of knowledge "there is simply a clear and distinct perception of what I am asserting" (CSM II, 24, AT VII, 35). If he has in mind "I am a thing that thinks," this claim can be easily handled by the above proposal. But if he has in mind "I exist," there appears to be a problem, as actual existence is contained in the nature of God, but not in the nature of everything else. In this case it is not simply his essence, but the fact of his own existence which he has before his mind.[14] Still another difficulty appears when we see that Descartes held that our knowledge that material things exist has the same level of certainty as our clear and distinct perceptions (*Principles* IV, 206, CSM I, 290). Here we cannot see this certainty as based on a perception of the nature of material objects, but as based on a perception of God, and a direct awareness of our faculties of sensation and imagination.

Concluding Remarks

Descartes' truth rule is central to his philosophy and the controversy surrounding it. Contemporary philosophers, when looking at Descartes, tend to read him as one who is primarily concerned with which of his beliefs are justified and which propositions he can safely take as true. Descartes is seen as holding that a belief should be accepted only if it is certain, and that the heirarchy of certain beliefs rests on a foundation.

It is true that Descartes was concerned with such questions as which propositions one should believe and that he thought (at least for questions of first philosophy) that one should believe only those propositions which are immune from doubt. But it is also true that Descartes used the word "true" for things other than beliefs, objects of perception, where what is qualified as true is not the operation of the mind, but the object. The truth rule appears to be absurd if it is glossed in terms of propositions: propositions which we perceive clearly and distinctly are true, whereas those which we can't are false. The rule is not absurd if understood in terms of trusting perceptions of natures.

While Descartes was concerned with the truth or falsity of judgements, his method for determining whether a judgement is true involved breaking the proposition judged down into its components, carefully examining what is before the mind, and forming correct concepts (that is concepts of true and immutable natures), from which one could then judge whether the proposition was true. Descartes' view was that the faculty of judgement itself should not enter into an inquiry until after the perception (or conception) was made clear and distinct. But given that *what I perceive* often turns out to have a propositional content, it is hard to maintain that seeing all the things clearly in the natures before one's mind does not involve judgement at some level.[15]

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Received January 27, 1994

NOTES

1. All references to the works of Descartes are to the Adam and Tannery edition (AT) *Oeuvres de Descartes*, 11 vols. (Paris: J. Vrin, 1964-74) and to the translation

by Cottingham, Stoothoff and Murdoch (CSM) *The Philosophical Writings of Descartes*, 3 vols., Vol. III with Anthony Kenny. (Cambridge: Cambridge University Press, 1984-91).

2. E.g., his reference back to the rule "I have already amply demonstrated that everything of which I am clearly aware [*cognisco*] is true" (CSM II, 45, AT VII, 65), and the recipe he gives for correct judgements, "If...I simply refrain from making judgements in cases where I do not perceive the truth with sufficient clarity and distinction..." (CSM II, 41, AT VII, 59).

3. Bernard Williams, *Descartes: The Project of Pure Inquiry* (Atlantic Highlands, NJ: Humanities Press, 1978).

4. Margaret D. Wilson, *Descartes* (London: Routledge and Kegan Paul, 1978).

5. Williams, p. 182.

6. Wilson, p. 141.

7. In discussing the passage that was taken to support position A, Williams says, "...what Descartes means here can readily be expressed by saying that one who merely considers or has in his mind an idea [now including propositions] does not thereby commit himself to any assertion, true or false" (p. 182).

8. Margaret Wilson discusses both of these difficulties on pp. 141-42 of her book. Her view is that given the problem of false propositions, perceiving p clearly and distinctly must be something more than simply understanding p, but given the second problem, must be something less than seeing that p is true. She suggests (p. 142) that the clear and distinct perception of p involves perceiving that the denial of p is contradictory. She recognizes that this proposal has its difficulties.

Her whole discussion of this point presupposes that when Descartes talks about the object of a clear and distinct perception, he is thinking about a proposition. We shall have cause to question this.

9. For example, *Principles* I, 50 (AT VIIa, 24, CSM I, 209): "Eternal truths are clearly perceived; but, because of preconceived opinions, not all of them are clearly perceived by everyone." Cf. also his statement when reviewing the *cogito* in the third Meditation that "In this first item of knowledge there is simply a clear and distinct perception of what I am asserting [*quod affirmo*]" (AT VII, 35, CSM II, 24).

10. In his reply to Arnauld, when discussing the difficult question of the material falsity of ideas, Descartes says that he is *not* referring to the falsity of the objects of the ideas (CSM II, 163, AT VII, 232).

11. Not all commentators have demanded that when Descartes uses the word "true" he must have in mind a proposition. Martial Gueroult, in *Descartes' Philosophy Interpreted According to the Order of Reasons*, trans. by R. Ariew (Minneapolis: University of Minnesota Press, 1984), uses the term "objective validity" to distinguish the truth of ideas from the truth of judgements. See Vol. I, p. 111. Norman Wells also talks of the truth of objects in "Material Falsity in Descartes, Arnauld, and Suarez," *Journal of the History of Philosophy*, vol. 22 (1984), pp. 27-28. Marjorie Grene, in *Descartes* (Minneapolis: University of Minnesota Press, 1985), states that Descartes rejected the notion of a judgement as the vehicle for truth in favor of clear and distinct perceptions. See Chapter 1, especially, pp. 7-12.

12. Wells takes Descartes' examples at AT VII, 37 (CSM II, 26) of a goat and a chimera to be examples of, respectively, true and false objects. (Wells, p. 34) This may be what Descartes had in mind. However, there is a sense in which Descartes does not think there are false objects, in that falsity indicates nonbeing.

13. I am using this locution roughly in the sense that C. I. Lewis does in *An Analysis of Knowledge and Valuation* (La Salle, IL: Open Court, 1946), p. 49. Lewis used this for what is meant by a nominalization of a sentence, such as "Mary making pies" or "that Mary is making pies." What I have in mind are such contents as *having angles which add up to two right angles* which Descartes said he found

when clearly and distinctly conceiving a triangle. Perhaps these are better expressed as properties with propositional content.

14. This difficulty, and the next one, were pointed out to me by Prof. Charles Marks.

15. This paper is based on work done during an NEH Summer Seminar held at Dartmouth College in the Summer of 1991. I would like to thank the director of the seminar, Willis Doney, and the other participants for helpful sugestions. An earlier version of this paper was read at the University of Washington.

The Philosophical Review, Vol. 102, No. 3 (July 1993)

Descartes on the Material Falsity of Ideas

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Judging from the opinions expressed by a number of recent commentators, one of the more perplexing concepts to be found in the *Meditations* is that of the material falsity of ideas.[1] Anthony Kenny, John Cottingham, and Margaret Wilson, in their separate discussions of material falsity, conclude either that this concept is fundamentally incoherent or, at least, that Descartes is not entirely consistent in the few accounts of it to be found in his writings.[2] I have no interest in minimizing the difficulties raised in attempting an interpretation of this concept. I would like to suggest in the course of this paper, however, that a consistent interpretation of material falsity is possible, and that such an interpretation can cast some light on a question that is of some importance in developing a comprehensive interpretation of Descartes's philosophy as a whole, namely, the question of what Descartes believed to be the ideative source of the fundamental error of attributing what John Locke was to call "secondary qualities" to material things.

There are two significant discussions of the material falsity of ideas in Descartes's writings. The first occurs in the context of Descartes's a posteriori proof, in the Third Meditation, for the existence of God, where Descartes examines those ideas that represent the sensible qualities commonly attributed to corporeal bodies, namely, the ideas of sense, and finds that they may be materially false. The second appears in the Fourth Replies, where Descartes, in response to some problems concerning material falsity raised by Antoine Arnauld, offers a more precise explanation of the nature of ideas of sense and of why he believes that they may be materially false. I will consider these two passages in turn, but first it will be useful to make some preliminary remarks concerning Descartes's theory of ideas.

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[1] In most cases initial references to Descartes's works in this paper are to *The Philosophical Writings of Descartes*, 3 vols., trans. John Cottingham, Robert Stoothoff, Dugald Murdoch, and Anthony Kenny (vol. 3 only) (Cambridge: Cambridge University Press, 1985–91), hereafter cited as "CSM," and additional references are to *Oeuvres de Descartes*, rev. ed., ed. C. Adam and P. Tannery (Paris: Vrin, 1964–76), hereafter cited as "AT." When the CSM translation is not used, AT is cited first.

[2] Anthony Kenny, *Descartes: A Study of His Philosophy* (New York: Random House, 1968), 118–21; John Cottingham, trans., *Descartes' Conversation with Burman*, with commentary (Oxford: Oxford University Press, Clarendon Press, 1976), 67ff.; Margaret Dauler Wilson, *Descartes* (London: Routledge and Kegan Paul, 1978), 101–19.

1.

There are two ways in which, according to Descartes, an idea can be said to represent something. The first way is conveyed in the manner in which Descartes initially defines the term 'idea' in the Third Meditation:

> Some of my thoughts are as it were the images of things [*tanquam rerum imagines*], and it is only in these cases that the term 'idea' is strictly appropriate—for example, when I think of a man, or a chimera, or the sky, or an angel, or God. (CSM 2:25, AT 7:37)

'Idea' is not appropriately applied to any thoughts or states of mind except those that can be said to be *rerum imagines*, that is, those that represent some thing or intentional object to the mind. Insofar as the thought has an object, it can be said to have a status apart from simply being a thought, a status that Descartes refers to as the "objective being" of the idea. Descartes stresses in his writings that the objective being of an idea is something to be found in the idea itself, not in its relation to its object. Thus Descartes objects to Caterus's reference to objective being as "simply the determination of an act of the intellect by means of an object," and thus as simply an "extrinsic denomination" (CSM 2:66–67, AT 7:92).

> Notice here that he is referring to the thing itself as if it were located outside the intellect . . . ; but I was speaking of the idea, which is never outside the intellect, and in this sense 'objective being' simply means being in the intellect in the way in which objects are normally there. (CSM 2:74, AT 7:102)

An idea, then, has objective being, and is the representation of something, quite apart from any relation, whether actual or hypothetical, it might have to a thing. In other words, the idea is in itself, or essentially, representative.

If we confine our attention to the idea itself, what does an idea represent? Perhaps the clearest answer in the *Meditations* is found in the Fifth Meditation, where Descartes writes,

> I find within me countless ideas of things which even though they may not exist anywhere outside me still cannot be called nothing; for although in a sense they can be thought of at will, they are not my invention but have their own true and immutable natures. (CSM 2:44, AT 7:64)[3]

Ideas, considered apart from the actual existence of their objects, represent the natures or essences of things having determinate character independently of the act of thought itself, things which Descartes tells us in the *Replies*[4] are known to have possible existence so long as our conception of them is clear and distinct.

If the possible existent that is represented in this manner by an idea actually does exist, then the idea can be said to represent something in a second way by virtue of the conformity of the objective being of the idea to the actualized nature, or what Descartes calls the "formal being," of an existing object. Descartes alludes to this conformity of the objective being of an idea to the formal being of a thing when he says, also in his response to Caterus, that "the idea of the sun is the sun itself existing in the intellect—not of course formally existing, as it does in the heavens, but objectively existing, i.e. in the way in which objects normally are in the intellect" (CSM 2:75, AT 7:103). Unlike the previous manner of representation, which is nonrelational and essential to the character of ideas, representation in this second manner does require a relation between an idea and an existing object. For the sake of clarity I will refer in this paper to the former, nonrelational sense of representation discussed above as "objective representation," and to the latter, relational sense as "formal representation."

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[3] This quotation would appear to discount fictitious ideas, such as the idea of a chimera, as representing true and immutable natures. But see the *Conversation with Burman* (CSM 3:343, AT 5:160), where Descartes suggests that at the very least the elements of which the idea of a chimera is composed are themselves immutable essences.

[4] See First Replies (CSM 2:83, 85; AT 7:116, 119) and Second Replies (CSM 2:107, 117; AT 7:150, 166).

Descartes sometimes opposes the term 'material' to 'objective' when referring to ideas, as he does when he writes in the preface to the *Meditations*, " 'Idea' can be taken materially, as an operation of the intellect. . . . Alternatively, it can be taken objectively, as the thing represented by that operation" (CSM 2:7, AT 7:9). Taking the idea materially, as opposed to objectively, means considering it as simply a thought or mode of the mind, without regard to its status as an objective representation. But we will find that when Descartes considers an idea "materially" as opposed to "*formally*," as he does in his discussion of material falsity, he does not discount the idea's objective being, by which it represents a possible existent, but only its status as a formal representation. Thus the meaning of 'material' varies depending on whether it is opposed to 'formal' or, as above, to 'objective'.

I will argue in this paper that what Descartes identifies as the crucial problem of materially false ideas has to do with their status as representations in the objective, as opposed to the formal, sense: representations of the nature or essence of possible existents. I will also argue that Descartes himself obscures this core issue in his account of the concept in the Third Meditation because he does not clearly distinguish the two senses of representation we have just considered. We will find evidence of this confusion in Antoine Arnauld's objections to the *Meditations*, and Descartes's attempt to rectify this confusion in his reply to Arnauld.

2.

The issue of the material falsity of ideas arises in the Third Meditation when Descartes comes to consider the ideas of extramental corporeal things, and in particular those ideas that represent various sense qualities as modes of these things. After considering those qualities of which he has a clear and distinct perception (in Lockean vocabulary, the primary qualities), Descartes turns to the other qualities that he has attributed to corporeal bodies (the secondary qualities), such as "light and colours, sounds, smells, tastes, heat and cold and the other tactile qualities" (CSM 2:30, AT 7:43), of which he says, ". . . I do not even know whether they are true or false, that is whether the ideas which I have of them are ideas of certain things, or not of things [*sint rerum quarundam ideae, an non rerum*]" (AT 7:43, CSM 2:30).[5]

Descartes immediately warns the reader that the truth or falsity at issue here is not the strict sense discussed earlier in the meditation.

> For although, as I noted a bit earlier, falsity strictly speaking, or formal falsity, can be found only in judgments, there is a certain falsity, material falsity, in ideas, when they represent what is not a thing as a thing [*non rem tanquam rem repraesentant*]. (AT 7:43, CSM 2:30)

In the earlier passage to which Descartes here refers he attempts to identify what, among the various thoughts he finds within himself, might be a source of error. He finds that so long as one does not "refer them to anything else" ideas cannot "strictly speaking be false; for whether it is a goat or a chimera that I am imagining, it is just as true that I imagine the former as the latter" (CSM 2:26, AT 7:37). That is, ideas, when they are taken as they are in themselves, and not as they are related epistemically to other things, do not pose any risk of error in the strict sense, for although all ideas have objective being and thus represent what is purportedly the essence or nature of something, we are not in this case taking them to be the representations of actual things. But we *do* consider them in this way when we make a judgment regarding what these ideas formally represent. As Descartes explains,

> the only remaining thoughts where I must be on my guard against making a mistake are judgements. And the chief and most common mistake which is to be found here consists in my judging that the ideas which are in me resemble, or conform to, things located outside me. (CSM 2:26, AT 7:37)

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[5] The French version of this passage is interesting and pertinent to the interpretation of material falsity offered in this paper: "j'ignore même si elles sont véritables, ou fausses et seulement apparentes, c'est-à-dire si les idées que je conçois de ces qualités, sont en effet les idées de quelques choses réelles, ou bien si elles ne me représentent que des êtres chimériques, qui ne peuvent exister" (AT 9:34). I will argue below that materially false ideas do not represent real things in the sense that what they do represent cannot exist, as the French version expresses more plainly than the Latin.

Falsity in the strict, or formal, sense occurs only when the representational content of our ideas is referred to something other than themselves, and is thus thought to conform to the formal being of, or to represent formally, something actual. This reference of objective being requires judgment.

Material falsity, by contrast, occurs "in ideas," not in judgments. That is, an idea can be said to be false in this sense whether or not it is made the subject of judgment, because falsity in this case is not due to the failure of the idea to conform to something to which it is referred in judgment, but rather to a failing of the objective representational content of the idea itself—the representation of "what is not a thing as a thing."

In the Fourth Replies, however, Descartes does define material falsity with reference to possible judgments, for he says there that ideas are materially false when they "are such as to provide subject-matter for error [*quod tales sint, ut judicio materiam praebeant erroris*]" (CSM 2:162, AT 7:231). Although Descartes doesn't clearly explain precisely how materially false ideas provide subject matter for error, it appears to be a consequence of his claim in the Third Meditation that materially false ideas represent what is not a thing as a thing. If in judgment we take the idea to be a true representation of a thing, we are then taking what are not things *to be* things and are in error. Determining the specific nature of the error involved will require some account of what Descartes means by saying that materially false ideas represent what are not things as things, a question that I will address below. For now it is sufficient to note that an idea is materially false only if the idea provides subject matter for error in the sense that judging the idea to be the representation of a thing results in error.

Now, it is a basic tenet of Descartes's epistemology, expressed in the Fourth Meditation and elsewhere, that any obscure and confused idea *may* provide subject matter for error in the sense that one can never be certain when making a judgment with respect to what a confused idea represents that one is not making a false judgment, and it is clear that Descartes believes all materially false ideas to be obscure and confused, for he claims in the Fourth Replies that material falsity "arises solely from the obscurity of the idea" (CSM 2:164, AT 7:234). But he also claims in the Fourth Replies that confused ideas which "give the judgement little or no scope for error do not seem as much entitled to be called materially false as those which give great scope for error" (CSM 2:163, AT 7:233). Descartes offers some examples to illustrate the distinction. "Confused ideas which are made up at will by the mind, such as the ideas of false gods, do not provide as much scope for error as the confused ideas arriving from the senses, such as the ideas of colour and cold" (CSM 2:163, AT 7:234). Thus the distinction between materially false ideas and those that are merely confused is less rigid than is suggested by the simple claim that the former provide subject matter for error. Some obscure and confused ideas are more liable to lead to false judgments than others, and Descartes calls those that are particularly misleading materially false. Ideas of false gods do not mislead because they are recognized to be the products of the imagination and as such are understood to be possible sources of error.[6]

We have, then, a threefold classification of ideas with respect to their apparent trustworthiness as the subject matter for judgment. First, clear and distinct ideas are known to be true when they are recognized as such once the rule that all clear and distinct ideas are true is established at the beginning of the Third Meditation, and so these ideas are known to result in true judgments. Second, there are those confused and obscure ideas, such as the factitious "ideas of false gods," that can be easily recognized as untrustworthy and thus are not likely to mislead one into making false judgments. The third classification, which includes materially false ideas, are ideas the trustworthiness of which is not readily apparent, and which are thus liable to lead to errant judgment because there is no recognizable feature of the idea itself (such as clarity and distinctness), or of the circumstances of the idea's appearance in the mind (such as, if the idea is factitious, that it is "made up at will by the mind"), that indicates whether or not the idea provides subject matter for error—whether or not, that is, it will result in false judgment.

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[6] We should note here, however, that Descartes also says in the same passage that ideas of false gods formed by idolaters can be said to be materially false insofar as they mislead the idolaters ("But as for the confused ideas of gods which are concocted by idolaters, I see no reason why they too cannot be called materially false" (CSM 2:163, AT 7:233)), an opinion he reiterates in the *Conversation with Burman* (see Cottingham, *Conversation*, 18). It appears that the deceptiveness of an idea is dependent to some extent on who has the idea. I will argue below that in fact ideas of sense are misleading only in the absence of a clear and distinct understanding of the real distinction between mental and material substance.

There are, then, two conditions that an idea must meet in order for it to be properly called materially false: (1) the idea must provide subject matter for error in the sense that if one were to judge that the idea is the true representation of a thing then the judgment would be false; and (2) a materially false idea must also lead to error in the sense that there is nothing in the idea itself or its circumstances of appearance that enables one to determine whether or not it meets condition (1).[7] Because of this second condition, a materially false idea cannot be recognized as such from an examination of the idea itself, which explains Descartes's inability in the Third Meditation to determine whether the ideas of sense are in fact materially false.

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[7] Norman J. Wells, in his article "Material Falsity in Descartes, Arnauld, and Suarez" (*Journal of the History of Ideas* 22 (1984): 25–50), believes, if I understand his argument correctly, that the second condition for material falsity identified here is sufficient, since, according to Wells, it is Descartes's inability to determine whether sensory ideas represent things or non-things that leads him to the conclusion that they do provide subject matter for error and are thus materially false. Referring to the passage from the Third Meditation cited below, Wells writes,

> Due to the alleged deficiency of our sensory ideas, in spectator-like fashion, we *cannot decide* judgmentally what their *objects* are. Do they represent a *reale quid et positivum* or a *nulla res*? It is just not possible to tell! In such a cognitive situation, our judgments are at risk because, in the presence of a flawed representation, we are in the presence of *materia errandi*. (37)

Wells's interpretation, however, does not explain why Descartes, in both the Third Meditation and the Fourth Replies, claims only to suspect that the idea of cold is materially false, not to know it: "*if it is true* that cold is nothing but the absence of heat, the idea which represents it to me as something real and positive deserves to be called false" (CSM 2:30, AT 7:44; my emphasis); "It is this idea [the idea of cold taken materially] which, I claim, can provide subject-matter for error *if it is in fact true* that cold is an absence and does not have as much reality as heat" (CSM 2:163, AT 7:232; my emphasis). Ideas of sense, for Descartes, provide subject matter for error, and are materially false, only if they represent non-things as something real and positive. Their status as what Wells calls "flawed representations," such that one cannot tell whether they represent something real or not, is, then, only a necessary, not a sufficient, condition for material falsity.

It is in meeting the first condition of material falsity that Descartes's claim that the ideas of sense, if they are materially false, represent what are not things as things is important. But what does Descartes mean when he makes this claim? What is it to represent a non-thing as a thing? Descartes's illustration in the Third Meditation uses the ideas of heat and cold.

> The ideas which I have of heat and cold contain so little clarity and distinctness that they do not enable me to tell whether cold is merely the absence of heat or vice versa, or whether both of them are real qualities, or neither is. And since there can be no ideas which are not as it were of things, if it is true [*siquidem verum sit*] that cold is nothing but the absence of heat, the idea which represents it to me as something real and positive deserves to be called false; and the same goes for other ideas of this kind. (CSM 2:30, AT 7:43f.)

This passage is confusing in a couple of respects. First, the choice of the ideas of heat and cold as an illustration suggests that representing non-things as things has to do with representing privative qualities as positive qualities. This would presume that secondary qualities can be classified either as positive qualities (such as heat), or as the absences of these qualities (such as cold), and that whereas all ideas of such qualities represent them as being positive, some of them represent qualities accurately as such while others represent what are in fact the absences of positive qualities. But Descartes leaves open the possibility that the ideas of heat and cold might both fail to represent real qualities, and by implication suggests that all such ideas may fail in a similar manner. This possibility, however, could not be understood in terms of positive and privative qualities.

Another source of confusion arises when we are told that the idea of cold would be materially false if it were true that cold is the absence of heat, for this explains *how* ideas are materially false only if Descartes tells us how he is supposing that it is true that cold is the absence of heat, something he does not do here. Descartes has, however, provided an account of formal falsity earlier in the Third Meditation, so it would be natural to suppose that he has in mind the correlative to formal falsity, namely formal truth.[8] Representing non-things as things turns out on this proposal simply to be formal falsity, the misrepresentation of actual things, and such a misrepresentation would then be materially false if we cannot tell whether it is a misrepresentation of an actual state of affairs. But, as we have seen, formal falsity requires the reference of an idea to an actual state of affairs that can occur only in judgment. This account of material falsity, then, cannot account for why Descartes claims that material falsity occurs "in ideas."

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[8] As we will see below, Antoine Arnauld appears to have interpreted the passage in just this way, an interpretation that Descartes explicitly rejects.

A clearer understanding of how materially false ideas represent what are not things as things, and how Descartes's illustration is relevant to this question, can be gathered from what Descartes believes the material falsity of an idea entails. Immediately after the passage quoted above, Descartes concludes:

> Such ideas [i.e., ideas of sense] obviously do not require me to posit a source distinct from myself. For . . . if they are false, that is, represent non-things [*nullas res repraesentent*], I know by the natural light that they arise from nothing [*nihilo procedere*]—that is, they are in me only because of a deficiency and lack of perfection in my nature. (CSM 2:30, AT 7:44)

While ideas of sense do have, like other ideas, representational content or objective being, it is clear from this passage, as Margaret Wilson notes,[9] that if these ideas are materially false they must lack objective reality, for if they had objective reality they could not be said to "arise from nothing" but would require a causal explanation in accordance with the clear and distinct principle, stated earlier in the meditation (CSM 2:28, AT 7:41), that there must be as much reality formally or eminently in the cause of an idea as there is objective reality in the idea itself.[10] This is confirmed when Descartes later distinguishes ideas of this type from the idea of God, which does require a causal explanation since, because of its clarity and distinctness, "it cannot be supposed that the idea of him exhibits nothing real [*nihil reale*] to me, as I said earlier concerning the idea of cold" (AT 7:46, CSM 2:31f.).

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[9] See *Descartes*, 111.

[10] I am presuming a distinction here, often ignored by commentators, between "objective being" and "objective reality." An idea has objective being, for Descartes, insofar as it represents anything at all. 'Objective being', then, is a general term ranging over any of the things, or the properties of things, represented by ideas insofar as things and their properties may be said to exist in the intellect (see CSM 2:75, AT 7:102). But, as Descartes makes clear in his account of objective reality in the Second Replies, the reality of a thing is just one of the many properties of things that may be objectively represented in our ideas. Thus just as we can talk of the objective reality of an idea, Descartes explains, "we can talk of

In denying that materially false ideas have objective reality, then, Descartes is denying that what is represented by these ideas as something real is in fact real. Thus Descartes's characterization of materially false ideas as representations of non-things is synonymous with the claim that they represent what is not real, or what lacks reality. That which has reality to some degree, in the sense with which Descartes is concerned in the Third Meditation, is that which has possible existence as an infinite or finite substance, or as an attribute or mode of a substance (CSM 2:128, AT 7:40).[11] Whatever is clearly and distinctly perceived as a substance or mode is known to be real in this sense, for as Descartes explains to Caterus, "possible existence is contained in the concept or idea of everything that we clearly and distinctly understand" (CSM 2:83, AT 7:116), but because of the confusion inherent in the ideas of sense, the reality or possible existence of the sense qualities represented by these ideas cannot be determined. In short, Descartes cannot determine whether these ideas represent possible modes of external objects. This explains Descartes's intention in using the ideas of heat and cold to illustrate material falsity, for if cold were simply the absence of heat, cold could not exist as a mode, but only as the absence of a mode, and consequently it would not have the reality that would be contained objectively in the idea of heat.[12] But since

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'objective perfection', 'objective intricacy' and so on. For whatever we perceive as being in the objects of our ideas exists objectively in the ideas themselves" (CSM 2:113f., AT 7:161). For more on this distinction, see Vere Chappell's "The Theory of Ideas," in *Essays on Descartes'* Meditations, ed. A. Rorty (Berkeley: University of California Press, 1986), 189–90.

[11] See also Descartes's accounts of the levels of reality in the Second Replies (CSM 2:117, AT 7:165–66), and in the Third Replies (CSM 2:130, AT 7:185). I believe I am in agreement here with Margaret Wilson (*Descartes*, 108), who also interprets Descartes's questions concerning whether something is real in terms of possible existence.

[12] Descartes says as much in an oblique reference in the First Replies to the discussion of material falsity in the Third Meditation. Pointing out to Caterus two instances in that meditation where he speaks of his clear and distinct knowledge of God, he says, "The first was where the question

this account of the material falsity of the idea of cold presumes the material truth of the idea of heat, it still does not explain in what way *all* ideas of sense may be materially false, that is, how they all might represent unreal things. Thus the illustration remains a source of confusion, since it is not appropriate to Descartes's main concern: the question of whether ideas of sense in general represent real things, that is, possible modes of external objects.

Now, Descartes understands possible existence in terms of what finite minds can judge to be possible for God to create, and this extends to whatever is logically possible, that is, whatever does not involve a contradiction. He makes this point at the beginning of the Sixth Meditation, where he says, "For there is no doubt that God is capable of creating everything that I am capable of perceiving [clearly and distinctly]; and I have never judged that something could not be made by him except on the grounds that there would be a contradiction in my perceiving it distinctly" (CSM 2:50, AT 7:71).[13] If, then, the idea of cold and other confused ideas of sense are materially false, and represent things that lack reality, the representational content of these ideas must involve a contradiction, and the existence of what is objectively represented by them must be logically impossible. Discovering the contradiction involved, however, requires a better understanding of what Descartes be-

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arose as to whether the idea which we form of God contains something real or only the negation of the real (as, for example, the idea of cold contains no more than the negation of heat) . . ." (CSM 2:82, AT 7:114).

[13] Cf. Letter to Regius, June 1642: "the only things that are said to be impossible for God to do are those which involve a conceptual contradiction, that is, which are not intelligible" (CSM 3:214, AT 3:567). These quotes may appear to be inconsistent with Descartes's well-known doctrine that God's power has no limits, logical or otherwise. But once it is established in the *Meditations* that God is not a deceiver, then his power of creation can be understood to extend only to what does not conflict with a clear and distinct understanding of things. It is also instructive to note a comment Descartes makes concerning this question in a letter dated 2 May 1644, reported in AT to have been addressed to Denis Mesland: "I agree that there are contradictions which are so evident that we cannot put them before our minds without judging them entirely impossible, like the one which you suggest: 'that God might have brought it about that his creatures were independent of him.' But if we would know the immensity of his power we should not put these thoughts before our minds . . ." (CSM 3:235, AT 4:118f.). I believe Descartes's point is that we cannot understand God's power to extend to the creation of a contradictory state of affairs so long as we are actively thinking of the contradiction.

lieves the idea of cold and the other confused ideas of sense represent. It was just this question that was the point at issue in Descartes's exchange with Arnauld.

3.

The confused ideas of sense are ideas of modes of extramental bodies—they represent certain sense qualities as the modes of corporeal things. But identifying the modes that Descartes believes are represented by the ideas of sense presents problems for interpretation, for it is here that the confusions mentioned earlier, resulting from Descartes's choice of the idea of cold as an example, become acute. Descartes says in the Third Meditation only that if cold is an absence, then "the idea which represents it to me as something real and positive deserves to be called false" (CSM 2:30, AT 7:44), which, as we have seen, suggests that the problem with the idea is that it misrepresents physical states of affairs beyond the mind. It appears to be this confusion that leads Arnauld to make a quite reasonable objection.

> What is the idea of cold? It is coldness itself in so far as it exists objectively in the intellect. But if cold is an absence, it cannot exist objectively in the intellect by means of an idea whose objective existence is a positive entity. Therefore, if cold is merely an absence, there cannot even be a positive idea of it, and hence there cannot be an idea which is materially false. (CSM 2:145, AT 7:206)

Arnauld puts the same point in even starker terms in a subsequent passage.

> What does the idea of cold, which you say is materially false, represent to your mind? An absence? But in that case it is true. A positive entity? But in that case it is not the idea of cold? (CSM 2:146, AT 7:207)

These conclusions appear to follow directly from Descartes's account of objective being in the First Replies, where he says that "the idea of the sun is the sun itself existing in the intellect" (CSM 2:75, AT 7:102). Arnauld simply adopts this formula in order to raise a problem with Descartes's account of material falsity. If cold is in actuality an absence, then the idea of cold is this absence itself existing objectively in the idea. But if this is what Descartes means by the idea of cold, then this idea could not be considered false, since it formally represents its extramental object. If, on the other hand, what Descartes refers to as the idea of cold is, as Descartes says in the Third Meditation, an idea of something positive, then this is not the idea of cold at all, and the issue of its misrepresentation of cold as an absence could not arise.

In response, Descartes first explains the confusion that he believes has led Arnauld to misinterpret the account of material falsity of the Third Meditation.

> Since ideas are forms of a kind, and are not composed of any matter, when we think of them as representing something we are taking them not materially but formally. If, however, we were considering them not as representing this or that [*hoc vel illud repraesentant*] but simply as operations of the intellect, then it could be said that we were taking them materially, but in that case they would have no reference to the truth or falsity of their objects. (CSM 2:163, AT 7:232)

The language is obscure here and liable to mislead, for it may appear that the formal/material distinction Descartes considers here is synonymous with the objective/material distinction that he explains in the preface to the *Meditations*.[14] But if this is Descartes's intent, then it would appear that considering an idea materially, as we do when we consider whether an idea of sense is materially false, is considering the idea as simply a mode of the mind, without any regard to its representational content or objective being. This, however, is not consistent with Descartes's claim in the Third Meditation that the problem of a materially false idea has to do with its representational content, for, as we have seen, materially false ideas represent what are not things as things. 'Formal' as it is used here, then, cannot be read as a synonym of 'objective', but is used with the same sense as in the Third Meditation, namely, as pertaining to the relation between the objective being of an idea and the formal being of its extramental object.

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[14] This is in fact how L. J. Beck interprets this passage. See Beck's *The Metaphysics of Descartes* (Oxford: Oxford University Press, Clarendon Press, 1965), 158.

Arnauld's mistake is that he takes the conformity of the objective being of an idea to the formal being of its extramental object as his criterion for defining the idea of cold. If cold is an absence, then the idea of cold, as Arnauld understands it, is simply the idea that formally represents this absence. Consequently Arnauld raises the issue, which Descartes considers a red herring, of how the idea of cold could misrepresent its extramental object, the absence of heat. Descartes, in considering the idea of cold and other ideas of sense materially, is not raising the issue of whether these ideas formally represent extramental objects, but is concerned only with what they represent objectively.

Arnauld, then, misconstrues the idea which is the object of Descartes's concern—the idea of cold, taken materially, that Descartes uses as an illustration in the Third Meditation. As a consequence of this, Arnauld also fails to understand what the mode is which Descartes takes to be objectively represented in the idea of cold. Descartes attempts to rectify the confusion in the following way.

> When my critic says that the idea of cold "is coldness itself in so far as it exists objectively in the intellect," I think we need to make a distinction. For it often happens in the case of obscure and confused ideas—and the ideas of heat and cold fall into this category—that an idea is referred to something other than that of which it is in fact the idea. Thus if cold is simply an absence, the idea of cold is not coldness itself as it exists objectively in the intellect, but something else, which I erroneously mistake for this absence, namely a sensation which in fact has no existence outside the intellect. (CSM 2:163, AT 7:233)[15]

The distinction that Descartes is making here is between the idea of cold as Arnauld understands it, which represents cold as an absence, and the idea that represents cold as something positive that Descartes suspects of being materially false. The passage itself is ambiguous, allowing two possible readings. Descartes may be identifying the idea of cold as the sensation itself to which he refers, in which case it is this sensation that objectively represents the sensible quality of cold as a mode of external bodies, albeit confusedly.[16] An alternative reading is that it is not the sensation of cold itself that Descartes identifies as the idea of cold with which he is concerned, but an idea that includes this sensation as a part of its objective content, and represents it confusedly as being of the same nature as, or resembling, a possible mode of matter.[17] Thus the idea exhibits to the mind what appears to be a possible mode of matter—the sensible quality of cold—although this quality, as it is directly perceived to exist in the mind, is simply the sensation of cold itself. If this is Descartes's meaning, then ideas of sense are not themselves sensations, but rather are ideas *of* sensations—ideas, that is, that represent sensations. The sensation does not of itself objectively represent material objects as having the particular mode in question (e.g., coldness), but rather the sensation *is* the mode in question, and the idea of sense confusedly represents it as being a mode that can exist extramentally in corporeal things.

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[15] The Latin reads,

> hoc enim saepe contingit in ideis obscuris et confusis, inter quas hae caloris et frigoris sunt numerandae, ut ad aliud quid referantur quam ad id cujus revera ideae sunt. Ita, si frigus sit tantum privatio, frigoris idea non est frigus ipsum, prout est objective in intellectu, sed aliud quid quod perperam pro ista privatione sumitur; nempe est sensus quidam nullum habens esse extra intellectum.

4.

I believe a key to deciding the question of which of the above readings of Descartes's response to Arnauld is correct is to consider what sort of ideas Descartes supposes the ideas of sense are. In the

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[16] Margaret Wilson and Anthony Kenny both appear to accept this reading of Descartes, since they both identify the idea of cold that Descartes suspects of being materially false as the sensation of cold. See Wilson, *Descartes*, 110f., and Kenny, *Descartes*, 120. See also Margaret Wilson's recent essay "Descartes on Sensation," in *Central Themes in Early Modern Philosophy: Essays Presented to Jonathan Bennett*, ed. J. A. Cover and Mark Kulstad (Indianapolis: Hackett, 1990), 1–5.

[17] A third interpretation of this passage might be suggested. Perhaps Descartes is concerned not with ideas that represent sensations as being of the same nature as possible modes of matter, but with ideas that simply represent modes of matter of some sort, corresponding to sensations, as possible existents, without any further specification of their nature. We should note, however, that Descartes claims in the Third Meditation to clearly and distinctly perceive certain material modes—the primary qualities—and carefully distinguishes these from the ideas of sense that he suspects of material falsity (CSM 2:30, AT 7:43). Since what is clearly and distinctly perceived is known to be possible, there can be no problem in conceiving of the possibility of material modes, except in the case of material modes of a different nature than primary qualities.

Third Meditation, Descartes classifies the ideas of sense which he suspects of being materially false as ideas of corporeal things (CSM 2:29, AT 7:43). Specifically, they are ideas that represent various sensible qualities—heat, cold, color, and the like—as the qualities of corporeal things. Whatever mental modes Descartes identifies as the ideas of sense, then, must have the capacity to fulfill the cognitive function of representing corporeal qualities.

Now, Descartes's understanding of qualities or modes, and the relationship they bear to the substances they qualify, has a significant consequence for his theory of ideas that is of particular importance to the present issue: an idea cannot represent a mode qua mode simpliciter. Put in another way, the idea of a mode always has as part of its representational content the substance of which it is a mode.

It is well known that Descartes understands a substance to be whatever does not depend for its existence on any other thing[18] excepting, in the case of created substances, the creative act of God. Descartes speaks to the implications of this view in the geometrical rendering of his metaphysics in the Second Replies. There he defines a substance as "every thing in which immediately resides, as in a subject, or through which exists whatever we perceive, that is, any property, quality, or attribute of which we have a real idea" (AT 7:161, CSM 2:114). Accordingly, a substance is that on which the existence of certain qualities or attributes depends as their immediate subject, but which is not itself likewise dependent for its existence on anything else. Mind, Descartes goes on to say, is that substance "in which thought immediately resides," as distinguished from body, "which is the immediate subject of local extension" (AT 7:161, CSM 2:114).

These texts suggest that to think of something as being a substance is to think of it as something that is qualified by, but does not itself qualify, other things, whereas a property, quality, or attribute is thought of as something that does qualify another thing. It is on this basis that Descartes, in the Fourth Replies, criticizes the view that the accidents of the communion bread survive through transubstantiation, for "the human mind cannot think of the accidents of the bread as real, and yet existing apart from its substance, without conceiving of them by employing the notion of a substance" (CSM 2:176, AT 7:253). Descartes's point here is that if we think of the accidents of the bread as existing independently of their substances, then we are errantly thinking of them as themselves substances. They are conceived of *as accidents* only so long as they are understood to depend for their existence on some subsistent thing of which they are accidents, and not to be subsistent things themselves.

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[18] There is an oblique reference to this definition of "substance" in the Third Meditation, where Descartes writes, "I think that a stone is a substance, or is a thing capable of existing independently, and I also think that I am a substance" (CSM 2:30, AT 7:44). Cf. *Princ.* 1:51, CSM 1:210, AT 8A:24.

Based on these texts, we might offer the following general account of the manner in which ideas can represent substances and the attributes or modes that exist in substances. To think of some thing, say *x*, as a substance is to think that there is some set of perceptibles *P* . . . *N* that qualifies *x*, and that there is no other thing which *x* itself qualifies. If, in addition, we think of the property of thought as necessarily being a member of this set, we are thinking of *x* as a mind; and if we think of the property of local extension as related to *x* in the same manner, we are thinking of *x* as a body. On the other hand, if we think of some perceptible *P* as itself qualifying some thing *x*, *P* is thought of as an attribute or mode of *x*.

If this is right, then we are thinking of substance in some manner whenever we think of any thing whatsoever, for either we think of a substance as the immediate subject of perceptibles, or we think of a substance as whatever is qualified by some perceptible of which we are thinking directly. In other words, a substance can be included in the representational content of an idea in two distinct ways: it can be contained objectively in the idea of the substance itself, and thus I can be said to think of a mind or of a material substance; or it can be contained objectively in the idea of an attribute or mode as the substance that has, or can have, the mode represented in the idea. In the former case I think directly of the substance; in the latter I am indirectly or mediately aware of it in the sense that I think of an attribute or mode as being a property *of something*, or, when my thought is more narrowly focused, *of mind* or *of body*.

If, then, in his response to Arnauld, Descartes means to identify sensations such as the sensation of cold as the ideas of sense which he says may be materially false, these sensations must have the capacity to represent corporeal things as the subjects of sensible qualities. There is, however, textual evidence from elsewhere in the *Meditations* and *Replies* that strongly suggests that Descartes did not believe that sensations, of themselves, could represent corporeal things,[19] which would mean that sensations cannot represent the qualities of these things.

One place where Descartes expresses this view is in his discussion of the wax example in the Second Meditation. Descartes observes that none of the sense qualities that he perceives in the wax while it is a solid remain in the wax after it has melted. And yet, despite the transitoriness of the sense qualities perceived, he makes the judgment that the same wax survives through this radical qualitative change. The conclusion that Descartes draws from these observations is that the perception of the wax itself as a substance is not achieved by means of the senses, but by the mind alone.

> [T]he perception I have of it [the wax] is a case not of vision or touch or imagination—nor has it ever been, despite previous appearances—but of purely mental scrutiny [*sed solius mentis inspectio*]. (CSM 2:164, AT 7:234)

Descartes reminds his critics of this conclusion in the Second Replies:

> [I]f you remember the remarks about the wax at the end of the Second Meditation you will realize that bodies are not strictly speaking perceived by the senses at all, but only by the intellect [*sed solo intellectu*]. . . . (CSM 2:95, AT 7:132)

By 'intellect' here, and by 'mind' in the Second Meditation, Descartes of course does not mean to refer, as he sometimes does by these terms, to thought in general, which includes sensations as modes of thought, but rather to that specific faculty of thought by which things are represented conceptually. Descartes's conclusion, then, is that the senses cannot represent material bodies.

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[19] Later Cartesians on the whole considered the view that sensations, unlike ideas proper, do not represent to be a central tenet of Cartesian epistemology. For a discussion of the views of the Cartesian school on this point, see Richard A. Watson, *The Downfall of Cartesianism, 1673–1712* (The Hague: Martinus Nijhoff, 1966), chaps. 3 and 5.

Another passage that confirms this view is found in the Sixth Replies, where Descartes distinguishes three levels of sensory response in humans. In their order of generation there is, first, the stimulation of the body's organs by external objects; second, the immediate effects produced in the mind by virtue of the mind's union with the body, which include the perceptions of "pain, pleasure, thirst, hunger, colours, sound, taste, smell, heat, cold and the like" (CSM 2:294, AT 7:437); and third, "all the judgements about things outside us which we have been accustomed to make from our earliest years . . ." (CSM 2:295, AT 7:437). Using as an example the perception of a stick, Descartes explains that the second grade of response

> extends to the mere perception of the colour and light reflected from the stick. . . . *Nothing more than this should be referred to the sensory faculty, if we wish to distinguish it carefully from the intellect.* But suppose that, as a result of being affected by this sensation of colour, I judge that a stick, located outside of me, is coloured; and suppose that on the basis of the extension of the colour and its boundaries together with its position in relation to the parts of the brain, I make a rational calculation about the size, shape and distance of the stick: although such reasoning is commonly assigned to the senses (which is why I have here referred it to the third grade of sensory response), it is clear that it depends solely on the intellect [*est a solo intellectu pendere*]. (CSM 2:295, AT 7:437f.; my emphasis)

The attribution of qualities or modes to an external corporeal body, whether they be the sensory qualities of which we have an immediate awareness or those requiring rational calculation, depends on the intellect alone. Sensations, of themselves, do not represent external things, nor the modes of external things.

According to this understanding of the nonrepresentational status of sensations, the idea of cold that Descartes suspects of being materially false, and which he classifies in the Third Meditation as an idea representing corporeal things, could not be identified as a sensation, for the simple reason that sensations, of themselves, do not represent corporeal things, and so cannot represent sense qualities as the properties of corporeal things. It is clearly Descartes's view, expressed in his response to Arnauld and the passage just quoted from the Sixth Replies, that one cannot attribute a sensory quality to a corporeal body unless one has the appropriate sensation. But the idea of cold that he identifies for Arnauld is not a sensation, but rather an idea of the intellect that represents a sensation as a possible corporeal mode.

5.

If this is correct then the idea of cold represents the sensation of cold as a mode that could exist in a material thing, where matter is represented in the idea as the immediate subject of the sensible quality of cold. But this can only mean that the idea itself is conceptually incoherent, for Descartes believes that sensations are in their essential nature modes of the mind.[20] As he explains in the Sixth Meditation:

> I find in myself faculties for certain special modes of thinking, namely imagination and sensory perception. Now I can clearly and distinctly understand myself as a whole without these faculties; but I cannot, conversely, understand these faculties without me, that is, without an intellectual substance to inhere in. This is because there is an intellectual act included in their essential definition. (CSM 2:54, AT 7:78)[21]

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[20] If this interpretation is correct then the issue of material falsity would have significant implications for the theory of sense perception. Descartes, in the *Optics* (CSM 1:153, 165; AT 6:85, 112f.), is critical of the view, which he attributes to the Scholastics, that what we directly perceive through the senses is an image ("intentional species") that is communicated to the mind from and resembles the object of perception. Since resemblance would require that image and object share formal characteristics, the material falsity of ideas of sense would mean that this theory is conceptually incoherent. Descartes clearly has this issue in mind in the Third Meditation, for he raises it twice before his discussion of material falsity (CSM 2:25, 26–27; AT 7:35, 38–40).

[21] Cf. Descartes's comment on this passage in the Sixth Replies: "when I examined all the modes of body and mind, I did not observe a single mode the concept of which did not depend on the concept of the thing of which it was a mode" (CSM 2:299, AT 7:444). Also see *Princ.* 1:61, where Descartes explains modal distinctions: "The first kind of modal distinction can be recognized from the fact that we can clearly perceive a substance apart from the mode which we say differs from it, whereas we cannot, conversely, understand the mode apart from the substance" (CSM 1:214, AT 8A:29).

If we understand the nature of any sensation clearly and distinctly, we can only understand it as a mode of the mind, for this is its essential nature.

The idea of cold, then, objectively represents a contradictory and therefore impossible state of affairs: it represents a sensation, which is by definition or essentially a mode of the mind, as though it were a mode of the same nature as, or resembling, a possible material mode. Thus if I think of the sensation of cold, and other sensations, in this manner, my thought is not only confused but incoherent, and any judgments that I make on the basis of this understanding of cold will involve this fundamental conceptual error, for I will thereby not only misconceive the nature of external bodies, or, more precisely, what modes can be consistently attributed to these bodies, but I will also misconceive the idea of sense itself, believing that what it represents (i.e., a sense quality) is a real quality or possible existent in matter when in fact it is not. I believe this is the sense of the somewhat obscure explanation of material falsity that Descartes offers to Burman.

> Even if I do not refer my ideas to anything outside myself, there is still subject-matter for error, since I can make a mistake with regard to the actual nature of the ideas. For example, I may consider the idea of colour, and say that it is a thing or a quality;[22] or rather I may say that the colour itself, which is represented by this idea, is something of the kind. For example, I may say whiteness is a quality; and even if I do not refer this idea to anything outside myself—even if I do not suppose that there is any white thing—I may still make a mistake in the abstract, with regard to whiteness itself and its nature or the idea I have of it. (CSM 3:337, AT 5:152)

What occasions false judgments, then, and what Descartes takes to be materially false, are not the sensations themselves, but ideas which represent these sensations and interpret their nature.[23] But there is another way in which sensations can be represented by an idea—they can be correctly represented as modes of the mind by an idea which represents the mind, not matter, as their proper subject. The resulting understanding of sensations is, Descartes tells us in the *Principles of Philosophy*, clear and distinct, for "pain and colour and so on are clearly and distinctly perceived when they are regarded merely as sensations or thoughts" (CSM 1:217, AT 8A:33).

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[22] That is, the idea *taken objectively* is a thing or quality in the sense that it objectively represents a thing or quality.

[23] It's interesting to note that after the passage quoted earlier where he identifies the idea of cold, Descartes changes the term he uses to refer to this idea, now calling it an "idea of the sensation of cold [*ideam sensus frigoris*]" (CSM 2:164, AT 7:235), in what appears to be an attempt to reflect more accurately his position.

Descartes's initial inability to discern the conceptual incoherence of his ideas of sense, and his consequent refusal to conclude in the Third Meditation that they are in fact materially false, stems, I believe, from the method he employs in the *Meditations*, what he calls in the Second Replies the "analytic method" (CSM 2:110, AT 7:155). When he raises the issue of material falsity in the Third Meditation, Descartes is considering those ideas which he has taken in the past, pretheoretically, to represent external bodies or the states of these bodies. At this point in the *Meditations* he clearly and distinctly perceives only that he is a thinking thing, a *res cogitans*, and that the thoughts he finds upon introspection are *his* thoughts—the modifications of the *res cogitans*—among which are numbered the sensations and the ideas, such as the ideas of cold and heat, that attribute something like these sensations to external bodies. These are the discoveries of the Second Meditation.[24] But the order of exposition proper for the analytic method requires that the discovery of the real distinction between mental and corporeal substance only be achieved in the Sixth Meditation. Consequently, it is only in the Sixth Meditation that Descartes can discover that the states of the mind, the thoughts, that he finds within himself in the Second Meditation, and which he again enumerates in the Third Meditation, cannot also be, and cannot be thought to be on pain of contradiction, states or modes of matter.

Thus Descartes's refusal in the Third Meditation to call the idea of cold and other ideas of sense materially false, a refusal that he retains in his response to Arnauld, must, I believe, be interpreted with reference to the point in the *Meditations* where the issue is raised. Descartes tells us that he cannot tell from an examination of the idea of cold itself whether this idea, which represents a mode of matter, represents a thing or a non-thing. Considering the structure of the *Meditations* this is only reasonable, since the broader understanding of corporeal substance necessary to evaluate whether the idea of cold represents a thing or a non-thing, that is, a possible or impossible state of affairs, is only achieved in the Sixth Meditation.

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[24] Most significant for our purposes is Descartes's discovery in the Second Meditation that the self that he now knows to exist is the same self "who has sensory perceptions, or is aware of bodily things as it were through the senses [*tanquam per sensus*]" (CSM 2:19, AT 7:29), an awareness that, as we have seen, he subsequently discovers is not achieved by means of sensations.

6.

If the interpretation that I have offered here of Descartes's notion of the material falsity of ideas is correct, the error that Descartes believes such ideas may lead to if they are made the subject of judgment is not simply an empirical error of misrepresentation occasioned by the inadequacy of our sense perceptions and our natural inclination for making precipitous judgments—such as one might make when judging that a submerged oar is bent because it looks bent—but, rather, is a deeper conceptual error that results from the conceptual incoherence of the representative content or objective being of the ideas of sense themselves. The issue raised by materially false ideas, then, must be understood as stemming from the central concern of Descartes's metaphysical project—that of achieving a clear and distinct understanding of the essential natures of things.

In a letter to Princess Elisabeth (21 May 1643), Descartes offers an account of this project as it is fulfilled in the *Meditations*. First he explains that "there are in us certain primitive notions which are as it were the patterns on the basis of which we form all our other conceptions" (CSM 3:218, AT 3:665). After identifying as primitive notions those of body as extension, the soul as thought, and the union of the two, Descartes goes on to explain that

> all human knowledge [*la science des hommes*] consists solely in clearly distinguishing these notions and attaching each of them only to the things to which it pertains. . . . In the *Meditations* that Your Highness condescended to read, I tried to give a conception of the notions which belong to the soul alone by distinguishing them from those

> which belong to the body alone. . . . It is in our own soul that we must look for these simple notions. It possesses them all by nature, but it does not always sufficiently distinguish them from each other, or assign them to the objects to which they ought to be assigned. (CSM 3:218f., AT 3:665ff.)

It is this misassignment to corporeal bodies of notions that properly pertain only to the soul as thinking thing that I have suggested we find, according to Descartes, in materially false ideas. Such ideas fail to conform to the conceptual "patterns" of our innate primitive notions of mind and matter, and thus constitute a conceptually confused representation of both mental and material substance. The task of arriving at a clear and distinct understanding of the nature of the material world that Descartes undertakes in his metaphysical and scientific writings requires that this fundamental conceptual confusion in our thought be revealed, and that the resulting prescientific conception of matter be replaced with the purely mathematical understanding that Descartes believed must underlie any true understanding of the natural world.[25]

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[25] I would like to thank Matthew Kelly, David Cole, and the referees of the *Philosophical Review* for their comments on previous versions of this paper.

[13]

JUDGMENT AND UNDERSTANDING IN DESCARTES'S PHILOSOPHY

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In this paper I try to clarify Descartes's view that judgment is an act of will, and explore whether the view is adequate and necessary for his philosophy.[1] Since Descartes's method is normative, and since 'ought to judge implies can judge,' a volitional theory of judgment would serve him well, but it is not, I shall argue, needed. Descartes's method is also foundationalist. His foundationalism seems unconnected with a volitional theory of judgment, but it is here, I shall argue, that the theory is needed. My strategy is as follows. In section I I set forth a connected sequence of propositions concerning the psychology and ethics of belief which Descartes definitely does and needs to affirm. In section II I clarify and partially defend the theory of mental activity Descartes takes to underlie these propositions, through consideration of various objections to it. In section III I outline the theory's role in defending epistemological foundationalism.

I

(1) I am compelled to believe what I clearly and distinctly understand. (I 160, 176, 183, 231, 236; II 41, 43) But (2) when I do not understand something clearly and distinctly, my belief is optional. (I 177, 234-35; CB 32) In particular, if I recognize I do not have a sufficient understanding of something, or recognize that the pros and cons on some issue counterbalance, I can suspend belief. And in particular, (3) I can disbelieve something while consciously recognizing its probability; indeed, the consideration that it is merely probable suffices to allow me to suspend belief. (I 176) Now (4) I cannot believe what I totally fail to understand. (I 159, 322; II 224; K 118) And (5) I rarely believe what I recognize at the time I do not adequately understand, but I do often think I sufficiently understand something when in fact I do not. (I 224, 236) (Among the factors which contribute to this are intellectual laziness, reluctance to admit ignorance, prejudice, preference of lofty and obscure to clear ideas, focus on words instead of things, wrongly seeming to recall knowing something, cognitive hubris, and even the very lust for knowledge, when unguided by proper method.) (I 139, 155, 183, 236, 438, etc.) (6) Though insufficiency of understanding is not naturally manifest, it is always detectable and often eliminable by proper method. So I may naturally enough be induced to believe what is obscure to me, but can avoid being so induced. But (7) it is not easy to avoid this; for example, instinctual beliefs and childhood prejudices are extremely difficult to shake. (I 148-49, 157) Still, (8) since by processes

in my control I can avoid error, my mistakes are ultimately my fault; I am responsible for my errors because I can avoid error and I am responsible for what I can avoid. Of course, (9) when seeking the truth, I do not choose to be deceived. as such. (I 235-36) But (10) choices I do make can bring about my deception.

So what should I do, given that my goal as theoretical inquirer is to maximize knowledge and minimize the risk of error? Generally put, (11) I should be maximally epistemically responsible. Now I realize that (12) what I believe depends at least in part on what sorts of evidence I take to be good, and that what sorts of evidence I take to be good depends at least in part on what method of inquiry (rules of acceptance, etc.) I adopt, and that (as history shows) there are alternative methods. I have some control over the cognitive training, which will influence my cognitive habits, which will influence my dispositions to believe. (13) It would be epistemically irresponsible not to train myself to suspend belief on anything I do not have good reason to believe. And if my goal is to discover permanent foundations for systematic science, it would be epistemically irresponsible not to train myself to suspend belief on anything I do not have irrevisably adequate reason to believe. (14) Since I have irrevisably adequate reason to believe only whatever I understand clearly and distinctly (I 160-61), and my goal is to discover permanent foundations for systematic science (I 144), I should only believe what I understand clearly and distinctly. (I 252; II 41, 43, 44, 116) (15) This requires thinking for myself, beginning with internal testimony, beginning with particular notions and connections and forming generalities from them, and so on, as delineated by my rules for the direction of the mind. (I 324-25; II 38, 127; CB 19)

II

What theory of mental activity underlies these claims? The outlines of the proposed theory are well-known. (I 174-78, 232-36) Judgment in general is an operation of one mental act, an exercise of the mental capacity called 'will,' upon a prerequisite but distinguishable mental operation, perception or representation, an exercise of the mental capacity called 'understanding.' (I 445-46) Judgment is a volitional act of either accepting, rejecting, or refraining from either accepting or rejecting, the testimony presented in an act of understanding. Erroneous judgment occurs when the appropriately limited understanding, by itself incapable of formal falsity or error (a privation or 'lack of something I ought to possess,' not a pure negation like ignorance) (I 173, 177, 232) is outstripped by the precipitous, unrestrained activity of a limitless free will, by itself incapable of explaining error since perfect after its own kind. (I 174-76, 233; II 224; K 118; CB 31, 32) The cure for error is to suspend judgment on anything not sufficiently evidently (clearly and distinctly) understood.

The outlines of the theory are well-known, but not, I think, well-understood. I shall try to clarify the theory in the process of evaluating some objections to it.

We should not be distressed by Descartes's occasional claim that the understanding judges. He uses 'understanding' in three ways, typically depending on his stage of inquiry. In its broadest usage$_1$, it is synonymous with either 'mental substance' or 'mental capacity,' 'mind,' 'soul,' 'thinking thing,' or 'power of thinking,' where every mental event counts as thought. In a narrower usage$_2$, it is synonymous with 'perception,' 'intellection,' roughly, the power to have ideas and to combine, compare, and recall them. (As I shall argue, some, but not all thoughts are ideas.) There are three sorts of ideas—sensible, imaginative, and supersensible—defining three modes of perception—sensation, imagination, and pure intellection. In its narrowest usage$_3$, it means 'pure understanding'; more especially, the 'faculty of clear and distinct perception.' And there are two importantly different uses of 'volition.' In its broader use$_1$, it is synonymous with '(power or) act of will,' which includes acts of desire and holding in aversion, and judgment as species. In the narrower sense$_2$, it is a species of will, another species of which is judgment.

Understanding$_1$ judges, but understanding$_1$ includes the will. Understanding$_2$ and volition$_1$ provide an exclusive and exhaustive division of understanding$_1$. Explicating Descartes's theory of judgment requires us to relate volition$_1$ to understanding$_2$ & $_3$.

We can advance this explication by considering what I take to be some unsuccessful objections to Descartes's theory. A first goes as follows: Knowledge and error are species of judgment. Since for Descartes all judgment is willful, that is deliberate or chosen, knowledge and error are willful. But they are not. Error in particular is something that just happens to me, as it were unconsciously, and so cannot be willful.[2]

(9) above shows that this objection misconstrues Descartes's view. Specifically, it wrongly conflates the willful and the deliberate in Descartes. The way Descartes self-consciously uses the notions, willful = voluntary = free (rather than free (= willful) ≠ voluntary). (especially K 149-50, 160-61) A will has (is) what Descartes calls a 'positive power to determine oneself,' which (setting God aside) entails both absence of actual external determination and absence of consciousness of constraint by an outside force.[3] Freedom for him is essentially self-determination. (K 149, 159-60) Now freedom does not entail direct avoidability for Descartes; witness unavoidable assent to clear and distinct perception ((1) above), 'spontaneous assent,' an instance of the freedom of spontaneity Descartes regards as the highest form of freedom. For the same reasons, freedom does not entail direct choice or deliberation either. (II 249)

Not all free acts are spontaneous. Acts performed either against the weight of reason, or in the absence of any preponderant rational inclination, are also free, so long as they are not externally determined. Such acts exemplify the freedom of indifference, which Descartes calls the 'lowest grade of liberty.' (K 159) Still, such acts are acts of self-determination too. But indifference is inessential to human freedom. (II 248-49) So, since for Descartes all freedom is either freedom of spontaneity or freedom of indifference, self-determination is sufficient as well as necessary for freedom. (K 150) But direct avoidability or choice are not necessary for self-determination.

A second cluster of objections may be treated together. These take Descartes's claim that judgment is will and will is limitless to imply either (a) that I can always affirm anything I can *think of*, or (b) that so long as the will is not compelled by a clear and distinct perception, I can make or withhold a judgment as I *please*. (c) Descartes's account of the origin of error in particular is portrayed as the process of (i) perceiving my evidence for p to be inadequate, still (ii) deciding to affirm p, and (iii) forthwith commencing to believe p. And (d) Descartes is taken to assume that whenever one knows one risks error by not suspending, it is in one's power to suspend.[4] But a counterexample to (a) is known or believed impossibilities; (b) we cannot control belief as we wish; (c) (ii) and (iii) is a phenomenologically discoverable impossibility—we cannot believe by a bare act of will, based on an arbitrary decision; and (d) is empirically implausible.

Descartes is committed to the view that I am always responsible for my explicit beliefs, since I adopt, either actively or by avoidable default, the rules of acceptance and criteria of evidence which determine my dispositions to believe, and I can train myself to be circumspect.[5] But he does not hold that at any given time I can believe what I want, or what I think I ought to believe. Otherwise doubt therapy would be unnecessary. Many of my pre-philosophical beliefs are "morally certain"; many are like natural instincts or are the products of uncritical conditioning. I cannot just decide to dismiss them, but need potent ('serious and maturely considered') epistemically possible doubtmakers to counterbalance their force. In general, if it seems to me via my understanding that p, I will be disposed to believe p, and I will believe p if my disposition is not opposed. But the opposition need not be another, occurrent perception of the understanding, but may result from prior cognitive training, for example, the sort of evaluation of epistemic rules concerning kinds of beliefs that occurs in Meditation I. Couched in the terms of the distinctions made above, sometimes, but not always, self-determination at t is avoidable at t, and sometimes, but not always, self-determination at t is a choice at t. But sometimes, when self-determination is not avoidable (or not a choice) at t, it is thus because of an avoidable act (or a choice) at t-n.

Specifically concerning (a): If I know p to be impossible (since I clearly and distinctly perceive this), then I am compelled to reject p. I cannot affirm p, but still I do reject p willfully, that is, with the freedom of spontaneity. If p only seems to me impossible (and I do not clearly and distinctly perceive that it is), then I can affirm p. Witness the deceiving God hypothesis in Meditation I. Although (as Descartes will recognize later) it is logically impossible, it is (at that stage) epistemically possible (not certainly false) and can serve as doubtmaker. The general reply shows that (b) and (c) misunderstand Descartes's view. (c) commits the additional mistake of depicting erroneous belief as the immediate product of a decision to believe, suggesting that belief is the result of an act of will, rather than identical with a volitional act. But judgment *is* a mode of willing. And when it is understood that Descartes's doxastic voluntarism is indirect, not direct, (d) does not seem empirically implausible to me.

On the positive side, (a) is right to note that we can only believe what we can think of. Descartes has been criticized for holding that we are free to accept any proposition whether or not we understand it, a mistake allegedly based on his confusing believing and saying.[6] But Descartes consistently maintains that judgment requires some degree of understanding. ((4) above) Without understanding, saying would be mere parroting of sounds, not judging. (II 131)

A third objection maintains that suspending judgment is equivalent to being aware one's perception is not sufficiently evident, not a consequence of such awareness. Therefore, when someone recognizes he lacks clear and distinct perception, theoretical room for a volitional act of suspension is eliminated.[7]

But the fact that a person recognizes he perceives something inadequately does *not* entail that he suspends judgment on it. People do believe things in the face of inadequate evidence. Something more than perception is involved in judgment.

Kenny's use of the Fregean-Harean model usefully suggests how this something more should be conceived. Kenny models Descartes's judgment-perception distinction on Frege's distinction between the sense and the assertion of a sentence, or more generally, on Hare's distinction between phrastic (which contains the descriptive content of the sentence) and neustic (which marks the mood of the sentence). Perceptions of the intellect are mental, unasserted phrastics. Affirmative judgment is the mental attachment of the neustic 'yes' to the phrastic presented by the intellect.[8] Following this suggestion, let us call belief, disbelief, and withholding 'ideational attitudes' (rather than propositional attitudes, since ideas need not be conceptually complex and so propositional). Judgment requires perception, but not conversely. A person cannot have an ideational attitude without an idea, but can have an idea without having any ideational attitude toward it. Further, the idea can be individuated in terms of its representative properties (as of x) without reference to any ideational attitude or to its truth-ground.

As useful as the Harean model is, it is inadequate because it cannot explain the connection between perception of the understanding and determination of the will. In particular, it cannot explain compelled assent to clear and distinct perceptions. Even if one sort of case—the case of conceptual truths—where a clear and distinct understanding of the meaning of a sentence is the normatively causal basis for its affirmation, fits the model, the model is not generally applicable. Fully apprehending the Fregean sense of a sentence is not in general sufficient grounds for believing it. Cartesian perceptions of the understanding provide evidential, not just semantic content. (A constructive account of this fact will be suggested in section III.)

The main thrust of my argument so far has been to show that Descartes can ground his methodological policies (and the normativeness of method they imply) in his volitional theory of judgment without violating internal consistency or any truths about judgment in general, or error or withholding in particular. But the question whether he *needs* a volitional theory remains. After all, cannot epistemically responsible procedures be grounded in voluntary acts of understanding? It is not as if only acts of will are voluntary for Descartes in our ordinary sense of 'voluntary.' Imagination, for example, is a Cartesian act of understanding which is nevertheless voluntary (in our sense). Why does Descartes place judgment and desire in one class, and sensation, imagination, and rational insight in another?

At one point Kenny answers this question by claiming that all and only acts of judgment and desire are for Descartes acts we perform if and only if we want to perform them.[9] But I have already argued that Descartes does not hold that at any time we can believe whatever we want. And it seems even more unCartesian to say that we can desire whatever we want.

Later Kenny offers the different conclusion that all and only mental activities which can have rightness or wrongness ascribed to them, since they are forms of commitment, are acts of will for Descartes. This is why, he says, Descartes mistakenly 'lumps together' affirmation and desire, and denial and aversion, confounding 'onuses of match' (in judgment, the onus is on the phrastic to match the world, while with desire, the onus is on our actions to match the phrastic).[10]

Descartes's use of Thomist theodicy does seem to assimilate intellectual to moral error, false assent to sin.[11] Since the properly used understanding cannot err, and understanding can be properly used, error is our own moral fault. ((8) above) And just as sin is caused by confusing bodily desires, error is caused by misleading bodily sensations. Indeed, Caton has argued that Descartes's theory of judgment functions *only* in his theological argument (where knowledge is virtue and error is sin), and suddenly appears in that context.[12]

I think the focus on (responsible) acts of commitment is correct, but I worry about Kenny's explanation as applied to volition in general. For example, Descartes says that 'nobody can will the end without willing also the means' (K 145). Now if I believe p, and recognize that q is a necessary condition for p, then, if I continue to believe p I must, on pain of irrationality, believe q. Whereas this is a principle I could plausibly ascribe to Descartes, I could not comfortably foist on him the principle that if I desire p, and recognize that q is a necessary means to attaining p, then, if I continue to desire p I must, on pain of irrationality, desire q. As a Kantian would say, willing implies commitment in a way in which desiring does not. And even if Kenny's criterion is satisfactory for desire as well as judgment, I do not see why Descartes has confounded onuses of match. He just has not explicitly introduced the difference.

I also worry about Caton's restrictive claim. After all, Aquinas pursued his theodicy without a volitional theory of judgment, so why cannot Descartes adapt it without holding that judgment is an act of will? Again, belief as a voluntary act of intellect seems sufficient.[13] In any event, after considering one more brief objection, I shall in section III sketch how the volitional theory plays an important epistemological role.

This last objection is really an attack on Descartes's theory of freedom, but applying it to judgment as a species of freedom is instructive. Kenny objects that having distinguished spontaneity from indifference, Descartes should have said indifferent actions are freer than those based on clear and distinct understanding in one sense, and less free in another sense, rather than one-sidedly demoting liberty of indifference.[14] Whether Kenny is correct depends on one's systematic philosophy, especially one's theory of value. Is effortless self-actualization, in which there is no room for perversity or aberration, not superior to Sisyphusian freedom?

In any event, as applied to judgment, Descartes's use of the distinction is clearcut. True knowledge is always a manifestation of the liberty of spontaneity, which never involves direct choice. Indeed, choice is the partially arbitrary and accidental factor that rules out a candidate judgment as knowledge (and in the end, being independent of my direct choice yet self-determined (thus following from my rational nature) is the methodological criterion of objective truth with respect to external and eternal matters).[15]

So, a non-spontaneously compelled act is either externally determined, in which case it is not judgment at all and so cannot be knowledge, or self-determined and accidental, in which case it is judgment but not secure or reliable, and so not knowledge.[16] (I 158) We cannot help spontaneous assent. Does it follow that we deserve no praise for knowing? No, since we deserve praise for putting ourselves in the irresistible position by adopting the right method, which includes paying attention. Paying attention is the key act of choice.[17]

III

Descartes is a foundationalist. The essential core of traditional foundationalism is the view that there are immediately justified beliefs which ultimately justify the entire remainder of a person's justified beliefs, that an immediately justified belief is a justified belief whose justification does not include any other justified beliefs, and that the justification relation is irreflexive, asymmetric, and transitive.

A foundationalist can be an externalist. Externalist accounts of justification only require that a justified belief be an instance of a reliable kind of belief (one likely to be true), and not that the justified believer be aware of this; they do not require introduction of the person's own perspective, and the truth of his belief may be no more than an accident. Externalism abandons the normative conception of justification on which to accept a proposition in the absence of good reason is to neglect the pursuit of truth, which would be epistemologically irresponsible. Descartes cannot be an externalist foundationalist.

Contrary to externalism, internalist accounts of justification are committed to the view that any source of justification must include an epistemic component. They are committed to denying that there are any nonepistemic properties, such as a belief's basis in perception, memory, or inference, such that any belief which has those properties must be justified.[18] But the epistemic source of justification would itself need justification. Internalism generates an infinite justificatory regress, and so cannot be Descartes's intended foundationalist position.

The foundationalist alternative to externalism is intuitionism, which purports to solve the regress problem not by appeal to other beliefs, but to intuition, direct awareness or acquaintance, or immediate apprehension. An intuition of state x allegedly supports the foundational belief about x. But intuitionism faces the following, powerful dilemma: If the intuition is not a cognitive grasp of x, it cannot support the belief about x. If the intuition is cognitive and identical with the belief itself, then how the belief is justified is left unanswered, we have abandoned intuitionism and moved to externalism. If the intuition is cognitive and distinct from the foundational belief, it is either an intuition *de dicto* or *de re*. If *de dicto*, it seems to require justification itself. If *de re*, there is a need to distinguish genuine from merely appparent intuitions, which requires a criterion C, which is such that (a) Person S need have no awareness of the fact that his intuition satisfies C, it need only satisfy it, or (b) S must intuit his intuition of x satisfies C, or (c) S must be justified in believing the intuition of x satisfies C. But (a) implies externalism, (b) implies an infinite regress of intuitions, and (c) implies that the justification of foundational beliefs is not immediate after all; further, (b) and (c) are cognitive states, seemingly requiring justification themselves.[19]

What is Descartes's response to this challenge? First, he makes clear that the intuition is not identical with the belief. Intuition is an act of understanding, belief is an act of will. Next, as regards the nature of the intuitions themselves, there are two sorts of cases. First, there are intuitions of psychological states, thoughts. They are *de re*. But if *de re*, according to the dilemma, their authentication requires a criterion. But a criterion is required only if we need to distinguish real from ostensible intuitions, and this need to distinguish presupposes that the object of intuition is somehow distinct from the act, and that the act may or may not succeed in apprehending its object.

This is just what Descartes denies. A thought is a mental event. An idea, the immediate object of consciousness, is the form of a thought insofar as that thought represents, that is, the specific nature of that thought. (I 158, 159; II 52) (Not all thoughts have (are) ideas. Only those that exhibit or represent are. In particular, acts of will such as judgments are not ideas. They are ideational attitudes (with their own forms).) We are conscious of what thoughts we are having by reference to their ideas. To put it in equivalent, twentieth-century, Ducassean garb an idea is a cognate accusative of the event of thought, cognate rather than objective accusative since identical (ontologically) with the thought.[20] To have an idea is to be directly aware of the determinate nature of one's awareness. So an intuition is the awareness of an accusative, or a determinate content, that is cognate with, and not an object of, the event of awareness, and the content, which is intuited on a given occasion, is the determinate nature that the event of intuition has on that occasion. Intuition is an act of awareness in which the act is aware of its own specific nature.

The second sort of intuition that plays a role in Descartes's epistemology is intuition of concepts and immediate conceptual connections. I am not sure what to say about these. A common and plausible tack is to say they are *de dicto*, and to account for their immediate justification on the grounds that simple conceptual connections are evident merely in virtue of being understood. My own inclination is to treat them as *de re*, and just as I did psychological states, since I read Descartes as a conceptualist for whom awareness of conceptual ties between simple notions is immediate awareness of the momentary structure of one's mind, and for whom eternal truths are structures of mind (I 239), but this is too difficult a topic to pursue here.[21]

Earlier I argued that Cartesian perceptions cannot be understood adequately as Fregean senses, since perception disposes the will, and clear and distinct perception determines the will, but Fregean senses can in general do neither. It seems to me that to appreciate that perceptions are immediately presented realities with immediately presented determinate natures is to begin to appreciate why they stand in the relations they do to acts of will, that is, acts of self-determination.

NOTES

[1] List of abbreviations: CB: *Descartes' Conversation with Burman*, translated and edited by John Cottingham (Oxford: Clarendon Press, 1976). I and II: *The Philosophical Works of Descartes*, translated by Elizabeth S. Haldane and G. R. T. Ross (Cambridge: Cambridge University Press, 1911, reprinted, with corrections, 1931), volumes I and II. K: *Descartes - Philosophical Letters*, translated and edited by Anthony Kenny (Oxford: Clarendon Press, 1970).

Primary texts used include *Meditations*, especially III and IV; *Principles*, Part I, 6, 31-39, 42-47, 66-71, and 75; I 445-46 (from "Notes against a Programme'); II 38, 41, 43, 52, 53, 55, 224-25; CB sections 15, 19, 21, 31-34.

At the outset I ought to make explicit two key, underlying assumptions of my project: (1) that Descartes aims to provide a general account of judgment, and that knowledge (and not just error) is a species of judgment; and (2) that for Descartes acts of understanding and acts of will are distinct, and not just two perspectives on a single mental event. These assumptions deserve scrutiny, but I do not provide it here.

[2] J. L. Evans, 'Error and the Will,' *Philosophy* (April, 1963), pp. 136-48, see especially 145-46.

[3] Does freedom require merely that I am not conscious of any external constraint, or more, that I am conscious (actually or potentially) that there is not external constraint? The weaker requirement is easily satisfied, but seemingly insufficient for freedom. The stronger requirement fares better as an account of freedom, but seems unsatisfiable. Similarly, when Descartes affirms the limitlessness of will, is he saying that we do not perceive bounds on what we can will, or that we perceive that there are no bounds on what we can will?

Interestingly, Haldane and Ross, Blom, and Lafleur unambiguously translate the Latin (Adam and Tannery, VII, p. 57: ita feramur, ut a nulla vi externa nos ad id determinari sentiamus.) into the weaker claim (HR, 175: 'we act so that we are unconscious that any outside force constrains us in doing so'; Blom, 220: 'we do not feel determined to it by any external force'; Lafleur, 55: 'we do not feel that any external force has constrained us in our decision'), whereas Cress and Anscombe and Geach allow for the stronger reading (Cress, 37: 'we sense that no external force could have imposed it on us'; AG, 96: 'we feel ourselves not to be determined by any external force'). On the other hand, all the aforementioned translations except AG unambiguously render clauses such as AT VII, p. 56, lines 29-30 strongly (HR, 174: 'I am conscious of a will so extended as to be subject to no limits'; Blom, 220: 'I certainly experience that it is circumscribed within no limits'; Lafleur: 'I experience that there are no limits which restrict it'; Cress: 'I observe that it is limited by no boundaries.' AG, 95 has it that 'I am aware of no bounds upon its scope.' Latin experts I have consulted at Vanderbilt give the stronger reading in both cases. A consistent Descartes's insistence on the introspective self-evidentness of the will (in *Principles* I, 39 and 41, for example) would seem to call for the stronger readings. On the other hand, it is difficult to see how a representational realist can ever claim to introspect the absence of external conditions. I believe that either reading allows me to conduct my argument in this paper.

[4] Attribution (a) is in Bernard Williams, *Descartes - The Project of Pure Enquiry* (Penguin Books, 1978), p. 171; (b) is in Anthony Kenny, *Descartes - A Study of His Philosophy* (Random House, 1968), p. 24; (c) is in Margaret Wilson, *Descartes* (Routledge & Kegan Paul, 1978), p. 145, and E. M. Curley, 'Descartes, Spinoza, and the Ethics of Belief,' in *Spinoza: Essays in Interpretation*, Mandelbaum and Freeman, eds., pp. 177-178. (d) is in Wilson, p. 148. The objections are (a) Williams, p. 171, (b) widespread, (c) Wilson, p. 145, Curley, pp. 177-8, and (d) Wilson, p. 149.

[5] Anthony O'Hear makes this point in 'Belief and the Will,' *Philosophy* (April, 1972), pp. 95-112. See especially pp. 108-111.

[6] Evans, p. 146.

[7] Curley, p. 175. Wilson reports and rejects this objection, p. 146.

[8] 'Descartes on the Will,' in *Cartesian Studies*, R. J. Butler, ed., p. 10.

[9] *Ibid.*

[10] *Ibid.*, pp. 15 and 17.

[11] Williams, p. 170, and others follow Gilson in this standard view. Kenny discusses it in his essay. More generally, it is interesting to note the inclination of several contemporary philosophers to model the logic of basic epistemic concepts on ethical concepts.

[12] 'Will and Reason in Descartes's Theory of Error,' *Journal of Philosophy* (February 27, 1975), pp. 87-104. See 88-90 for the cited claims. Caton's provocative article exemplifies an interpretation which rejects my underlying assumption (1) (see note 1). For Caton, Descartes has a necessitarian theory of knowledge, and only a voluntarist theory of error; knowledge is not an act of will, only wrong commitments are acts of will. In the end, I suppose that Williams also rejects my assumption, since he denies that the account of will is intended to apply to irresistible certainties. Naturally I believe my two assumptions can be defended, but I do not purport to defend them in this paper.

[13] Kenny makes this point, pp. 8-9. Notice how my second assumption is operating here.

[14] *Ibid.*, p. 31.

[15] Caton makes these points, pp. 94 and 102.

[16] This idea still appears in some contemporary accounts of knowledge, on which it cannot be accidental (and so potentially misleading) that the evidence supports one's true belief.

[17] Consider K 66, that there are things knowable by the natural light that no one has yet reflected on; K 150, that compelled assent is meritorious since one can, but need not, pay attention so that the compulsion follows; and II 126, 231, and 266, that doubt got as far as it did by inattention. But paying attention is not identical with having one's attention captured, and the latter, as it turns out, coincides with the having of simple intuitions, which are acts of understanding, not of will.

[18] There is widespread discussion of the externalism-internalism issue. This way of formulating the internalist's commitment was evoked by some things Ernest Sosa says in his articles, 'The Raft and the Pyramid: Coherence versus Foundations in the Theory of Knowledge,' in *Midwest Studies in Philosophy* (V, 1980), French, Uehling, and Wettstein, eds., pp. 3-25, and 'The Foundations of Foundationalism,' in *Nous* (1980) pp. 547-564. See especially pp. 17-18, and 551 ff., respectively. Sosa himself is not explicitly focusing on the externalism-internalism issue in these passages.

[19] A systematic elaboration of this dilemma occurs in *Justified Belief: Reasons, Regresses, and Foundations in Epistemic Justification*, an unpublished doctoral dissertation (Vanderbilt, 1982) by Paul Moser, who defends Ducassean intuitionism as an account of justified, perceptual belief.

[20] Arnauld was right, and Malebranche wrong, in his interpretation of Descartes's theory of ideas. I think this is an important point for understanding Descartes's notion of objective reality, for defending Descartes against the charge of ambiguity in his use of the word 'idea,' and for other purposes, but I cannot pursue it here.

[21] For a bit on this, see note 29 (pp. 72-3) of my 'Certainty and Cartesian Method,' in *Descartes - Critical and Interpretive Essays*, Michael Hooker, ed., pp. 40-73.

[14]

DESCARTES'S THEORY OF JUDGMENT

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Professor Tlumak has tried to make several contributions to our understanding of Descartes's theory of judgment. I shall do two things to assess his attempt. First, I'll locate his position within the current literature on Descartes's theory, by presenting the main questions that have been raised about the theory, indicating which ones Professor Tlumak answers and which ones he ignores and outlining his answers. Second, I'll present three objections to his answers. I hope to show that, while Professor Tlumak's position is both positive and original, it is also problematic.

1. Commentators on Descartes's theory of judgment have been concerned with at least five main questions. Some are interpretative; others evaluative.

One question is obvious: What is Descartes's theory? The outlines are clear enough, but the details are vague. It is clear, for example, that Descartes adopts:

The Limited Understanding Thesis:

> Our understanding is limited (HR I, 177 & 233).[1]

The Unlimited Will Thesis:

> Our will is unlimited (HR I, 174 & 233).

The Natural Compulsion of the Will Thesis:

> Whenever we clearly and distinctly perceive a proposition, we are naturally compelled to believe it (HR I, 153).

The Clear and Distinct Perception Thesis:

> Any proposition we perceive clearly and distinctly is true (HR I, 178).

It isn't clear how we are to understand these claims. What do 'limited' and 'unlimited' mean in the first two? What does 'clear and distinct perception' mean in the last two?

A second topic of concern is: What's the relation between the theory of judgment, as it is presented in the *Meditations*, and Descartes's statements in earlier works about judgment, the understanding and the will? Anthony Kenny (K, 2-5) has claimed that the theory of judgment in the *Meditations* is a radical departure from Descartes's earlier views. Hiram Caton (C, 88) has argued that the theory in the *Meditations* is more a development of, than a departure from, Descartes's earlier positions.

A third question is whether the theory of judgment contains any problems. Two major objections have been made to it: (1) it contains clearly mistaken claims about the nature of belief (E, O, WB, WM); and (2) once its central concepts are clarified, it turns out to be inconsistent with Descartes's other views (E, WB, WM).

Still another questions is: What role does the theory play in Descartes's philosophy? Caton (C, 90) has argued that Descartes presents his theory of judgment in the *Meditations* mainly, if not solely, to solve a version of the problem of evil. Margaret Wilson (WM, 139-140) and Bernard Williams (WB, 164) have claimed that Descartes is out to take on the problem of evil but also to "ground" his method by showing how we can avoid error. It is important to distinguish between two issues here. The first is what role does Descartes assign the theory; that is to say, what parts of his philosophy does he intend it to support or explain. The second is what role does the theory actually play in Descartes's philosophy; that is to say, what parts of his philosophy does it actually support or explain.

Last of all, there's the question of whether the theory of judgment can be reconstructed in a way that retains its central insights, frees it of its major problems and lets it play its assigned role in Descartes's philosophy. Wilson (WM, 146-150) has attempted one such reconstruction.

Professor Tlumak doesn't try to answer all these questions. He ignores the issue of the relation between the theory of judgment as it is developed in the *Meditations* and Descartes's earlier views. He ignores the issue of whether the theory can play its role in Descartes's philosophy despite its problems. (It is understandable that Professor Tlumak ignores this last issue; he finds no serious problems in the theory.)

Professor Tlumak deals with the three remaining issues in a positive and original way. He responds to the question of what the theory is by outlining the theory and attempting to clarify parts of it. In response to the question of whether the theory contains any problems, he takes on Descartes's critics and argues that the theory doesn't violate "internal consistency or any truth about judgment in general, or error or withholding in particular" (T, 94). Professor Tlumak examines the theory's role in Descartes's philosophy in the last two sections of his paper. He argues that Descartes doesn't need his theory of judgment to solve the problem of evil or for his method. He offers the new view that Descartes needs his theory of judgment to defend his nonexternalist foundationalism.

Professor Tlumak's treatment of these issues contains serious problems. His defense of Descartes doesn't adequately answer an objection to Descartes's claim that the understanding is limited but the will unlimited. He ignores a common criticism of Descartes's thesis that the will is naturally compelled to assent to clear and distinct perceptions. He fails, in his explanation of the theory's role, to show that Descartes adopts a nonexternalist foundationalism or that Descartes's adoption of such a position would require him to adopt his theory of judgment.

I now want to develop each of these objections.

2. Let me start with the criticism that Tlumak does not adequately answer an objection to Descartes's claim that the understanding is limited but the will unlimited. Descartes makes this claim in the *Meditations* and *Principles.*

> For I have certainly no cause to complain that God has not given me an intelligence which is more powerful, or a natural light which is stronger than that which I have received from Him, since it is proper to the finite understanding not to comprehend a multitude of things, and it is proper to a created understanding to be finite. (Meditation Four; HR I, 177)

> [A]s a matter of fact I am conscious of a will so extended as to be subject to no limits. (Meditation Four; HR I, 174)

> Further the perception of the understanding only extends to the few objects which present themselves to it, and is always very limited. The will, on the other hand, may in some measure be said to be the infinite, because we perceive nothing which may be the object of some other will, even of the immensity of the will that is in God, to which our will cannot also extend, so that we easily extend it beyond that which we apprehend clearly. (*The Principles*; HR I, 233)

How are we to understand the thesis that the understanding is limited? Descartes's point seems to be that his understanding is limited in that he is unable to perceive some true propositions clearly and distinctly.

The Limited Understanding Thesis*:

> Each human being is such that there are true propositions he cannot clearly and distinctly perceive.

What about the thesis that the will is unlimited? The account of how the understanding is limited and Descartes's remark that "we perceive nothing which may be the object of some other will, even of the immensity of the will that is in God, to which our will cannot extend" support:

The Unlimited Will Thesis*:

> Each human being is such that there is no true proposition to which some will can assent but he cannot.

We can now raise against Descartes a variation on a criticism made by Evans (E, 146) and Williams (WB, 171-176) which Tlumak (T, 92) tries to answer. The Unlimited Will Thesis* is false. Someone might consider a true proposition to which God assents, have no evidence for it, strong evidence against it and, in the face of that evidence, be unable to assent to it. Williams puts the point this way:

> Descartes's formulations invite us to think . . . that someone could just decide on a belief in the teeth of what they recognize as reasons against it. (WB, 177)

I'm confident Professor Tlumak doesn't accept this criticism of Descartes. I suspect he thinks it is based on a misinterpretation of the Unlimited Will Thesis, since he tells us:

> He (Descartes) does not hold that at any given time I can believe what I want. (T, 92)

Tlumak may be right. Yet, his mere assertion that the objection is based on a misinterpretation is not enough to answer it. He must explain why the interpretation I've just sketched is incorrect, present an alternative account of how the understanding is limited but the will unlimited and show that that alternative account captures Descartes's remarks while saving him from the objection. He does not do this in his paper. Until he does, he cannot correctly claim to have shown that Descartes's position violates "no truths about judgment in general" (T, 94).

3. My next criticism of Professor Tlumak's defense of Descartes is that he ignores a common objection to Descartes's theory. The theory of judgment contains:

The Natural Compulsion of the Will Thesis:

> Whenever we perceive a proposition clearly and distinctly, we are naturally compelled to believe it.

Descartes puts the point this way in the *Meditations*:

> I am of such a nature that as long as I understand anything very clearly and distinctly I am naturally impelled to believe it to be true. (HR I, 183)

Descartes makes other important claims about clear and distinct perception, including that all clear and distinct perceptions are true (HR I, 178), that some clear and distinct perceptions can be rendered uncertain by the demon hypothesis (HR I, 158),[2] that some perceptions of contingent propositions are clear and distinct (HR I, 158), and that clear and distinct perception, unlike judgment, is an act of the understanding and not the will (HR I, 178). Several commentators, including Evans (E, 139), O'Hear (O, 103), Williams (WB, 182-183) and Wilson (WM 141-142), have argued that the Natural Compulsion of the Will Thesis is inconsistent with Descartes's other claims. When we define clear and distinct perception to allow for the thesis, we contradict at least one of the other claims. When we define clear and distinct perception to allow for the other claims, we contradict the thesis.

Consider these definitions.

D1: S clearly and distinctly perceives that p = df. S perceives in an overwhelming and lucid way that p is true.

D2: S clearly and distinctly perceives that p = df. S perceives that not-p is contradictory.

D3: S clearly and distinctly perceives that p = df. S is certain that p.

D4: S clearly and distinctly perceives that p = df. S believes he is certain that p.

D1 is Wilson's creation (WM, 141). It seems to be consistent with Descartes's other claims about clear and distinct perception, but, as she has pointed out, it is inconsistent with the Natural Compulsion of the Will Thesis. It implies that in each case of clear and distinct perception, "assent would be inevitable not because of an irrestible impulsion of the will, but because of logical entailment" (WM, 142). Wilson has also presented D2 and pointed out that, while it is consistent with the Natural Compulsion of the Will Thesis, it is inconsistent with the claim that some clear and distinct perceptions are contingent. D3 is consistent with the Natural Compulsion of the Will Thesis but contradicts the claim that some clear and distinct perceptions are rendered doubtful by the demon hypothesis. D4 is consistent with the thesis. It, however, contradicts the claim that clear and distinct perception, unlike judgment, is an act of the understanding.

Professor Tlumak may have a way to defend Descartes against this objection. He doesn't present it, however, and, until he does, he is not justified in claiming Descartes can adopt the theory of judgment without "violating internal consistency" (T, 94).

4. It's time to consider Professor Tlumak's claim that Descartes needs his theory of judgment for his nonexternalist foundationalism. Let me explain how I understand his position, before I present my objections to it.

I've pointed out that the question, What role does the theory of judgment play in Descartes's philosophy?, is ambiguous. We can interpret it as: What parts of Descartes's philosophy does Descartes intend for the theory to explain or support? We can interpret it as: What parts of Descartes's philosophy does the theory explain or support? Professor Tlumak does not indicate clearly which question he is answering. Consider his statement of the issue.

> But the question of whether he (Descartes) *needs* a volitional theory remains. After all, cannot epistemically responsible procedures be grounded in voluntary acts of the understanding? It is not as if only acts of will are voluntary for Descartes in our ordinary sense of 'voluntary.' Imagination, for example, is a Cartesian act of the understanding which is nevertheless voluntary (in our sense). Why does Descartes place judgment and

> desire in one class, and sensation, imagination and rational insight in another? (T, 94; the first parenthesis is mine)

The first four sentences suggest to me a concern with what parts of Descartes's philosophy the theory of judgment in fact supports or explains. The last suggests to me a concern with what parts of Descartes's philosophy Descartes intends for the theory to support or explain.

Since it is unclear what question Professor Tlumak is answering, it is unclear what answer he is giving. Is his position that Descartes adopted a nonexternalist foundationalism, decided that this sort of foundationalism committed him to a volitional theory of judgment and so developed such a theory? Is his position that Descartes adopted a nonexternalist foundationalism, on the one hand, and a volitional theory of judgment, on the other, and it so happens that the former requires the latter?

I think Professor Tlumak's position is the second: Descartes adopts these two theories and it so happens that one of them requires the other. I understand him in this way mainly because he never presents the sort of textual evidence necessary to defend the first position with its attribution of a specific intention to Descartes.[3]

That's how I understand Tlumak's position. Let me give my first criticism of it. The terms 'foundationalism' and 'externalism' can be used to refer to a variety of positions. Professor Tlumak's discussion (T, 96) leads me to think he uses the terms in such a way that a nonexternalist foundationalist is someone who adopts two principles:

Foundationalism Thesis:

> Some propositions we are justified in believing are such that their justification does not include any of our other justified beliefs; these propositions ultimately justify all our other beliefs.

Nonexternalism Thesis:

> A proposition is justified for us only if we are aware of the fact that it meets some condition, C, and aware of the fact that propositions that meet C are (generally) true.[4]

I have no quarrel with Professor Tlumak's attribution of the Foundationalism Thesis to Descartes. I do object to his attribution of the Nonexternalism Thesis to Descartes. He does not cite any passages in which Descartes adopts the thesis, and I don't know of any he might cite. He argues (T, 96) that Descartes is committed to the thesis by his normative conception of justification, but his argument, insofar as I understand it, is unsound.

Here's his reasoning.

> Externalism abandons the normative conception of justification on which to accept a proposition in the absence of good reasons is to neglect the pursuit of truth, which would

be epistemically irresponsible. Descartes cannot be an externalist foundationalist. (T, 96)

Tlumak long-jumps from a premise about Externalism to a conclusion about Descartes. My best guess at what he has in mind is:

I 1. Descartes adopts the position (X) that we are justified in believing a proposition only if we may assent to it.
2. Descartes adopts the position that (Y) we may assent to a proposition only if we have determined that we perceive it clearly and distinctly and that all our clear and distinct perceptions are true.
3. Propositions (X) and (Y) imply the Nonexternalism Thesis.
4. Therefore, Descartes is committed to the Nonexternalism Thesis.

The difficulties with this argument become apparent once we clarify some of its language.

Descartes's epistemology contains two main kinds of epistemic certainty: moral certainty and metaphysical certainty.[5] They give us two ways to understand the concept of justification as it occurs in the Foundationalism Thesis, the Nonexternalism Thesis and the premises of (I).

D5: p is justified for S = df. p is a moral certainty for S.
D6: p is justified for S = df. p is a metaphysical certainty for S.

There are three ways to understand the concept of permissible assent used in argument (I), since we can extract three different rules governing assent from Descartes's remarks. He allows himself to assent to moral certainties when engaged in practical affairs (HR II, 206). At the start of Meditation One, he decides to assent to only what is both true and metaphysically certain for him (HR I, 145). At the end of Meditation Four, he decides, now that he knows that all his clear and distinct perceptions are true, to assent only to what he perceives clearly and distinctly (HR I, 178). We have:

D7: S may assent$_1$ to p = df. p is a moral certainty for S.
D8: S may assent$_2$ to p = df. p is a true metaphysical certainty for S.
D9: S may assent$_3$ to p = df. S knows that he perceives p clearly and distinctly and that all his clear and distinct perceptions are true.

The second premise of (I) is true, if permissible assent is understood in terms of D9. It is false, if permissible assent is understood in terms of D7 and D8. Descartes does not believe that a proposition is a moral certainty or a true metaphysical certainty for him only if he has determined that he perceives it clearly and distinctly and that all his clear and distinct perceptions are true. He takes the proposition that he exists to be a moral certainty and a true metaphysical certainty for him at the start of Meditation Two (HR I, 150); he doesn't know that all his clear and distinct perceptions are true until the end of Meditation Four. When he reports his metaphysical, and so moral, certainty of his existence in Meditation Two (HR I, 150), he doesn't make any mention of a clear and distinct perception of his existence.

Yet, while the second premise is only true if understood in terms of D9, the first premise is false when understood in that way. Whether we define justification in terms of moral certainty or metaphysical certainty, Descartes does not maintain that we are justified in believing a proposition only if we may assent to it in the sense that we know we clearly and distinctly perceive it and that all our clear and distinct perceptions are true. His position in Meditation Two about his knowledge of his existence is a fine example of this fact. That he exists is a metaphysical, and so a moral, certainty for him. Yet, he is not in a position where he may assent to it in the sense that he knows he clearly and distinctly perceives it and that all his clear and distinct perceptions are true. He isn't in that position until the end of Meditation Four (HR I, 178).[6]

Argument (I), then, is unsound. There may be a sound interpretation of Professor Tlumak's reasoning, but I don't know what it is.

Professor Tlumak also fails to show that if Descartes did adopt a nonexternalist foundationalism, he would then need to develop a volitional, rather than a nonvolitional, theory of judgment. His argument (T, 96-7), as I understand it, is:

II 1. If Descartes adopts a nonexternalist foundationalism, he is committed to the view that each justified foundational belief is justified by an act of intuition distinct from the act of belief.
2. If Descartes is committed by this view, he must explain how the one act is distinct from the other.
3. The only way for him to explain this is to say the act of intuition is an act of the understanding and the act of belief is an act of the will.
4. Therefore, if Descartes adopts a nonexternalist foundationalism, he needs to say acts of intuition are acts of the understanding and acts of belief are acts of the will; i.e. he needs a volitional, rather than a nonvolitional, theory of judgment.

I fail to see why we should accept premise (3). First, it's not clear that Descartes can explain the point at hand by locating intuition in the understanding and belief in the will. Descartes takes intuition to be a form of clear and distinct perception (HR I, 33); we saw earlier that it is hard to find a definition of clear and distinct perception that captures Descartes's major claims about it but doesn't make believing part of clearly and distinctly perceiving and so make clear and distinct perception and belief acts of the same faculty. Second, Descartes can just as well explain the difference between acts of intuition and acts of belief by saying they are performed by different subfaculties of the understanding, as he can by saying they are performed by different faculties of the mind. The explanations are equally (un)informative.

5. Let me say a few things to conclude my remarks.

Professor Tlumak's position has some attractive features. It's positive in its attempt to defend Descartes. It's original in its use of the distinction between externalist and nonexternalist brands of foundationalism to study the basis for Descartes's theory of judgment.

His position has some flaws. His defense of Descartes does not answer an objection to Descartes's view that the understanding is limited but the will unlimited. He ignores a common objection regarding the Natural Compulsion of the Will Thesis. He fails, in his explanation of the theory's role, to show that Descartes is a nonexternalist foundationalist or that Descartes's being one would require him to adopt a volitional theory of judgment.

Professor Tlumak may be able to revise his position so as to preserve its attractive features but eliminate its flaws. If he does, he will make an outstanding contribution to our understanding of Descartes's theory of judgment.

BIBLIOGRAPHY

(C) Caton, Hiram, "Will and Reason in Descartes's Theory of Error," *The Journal of Philosophy* (February 1975).

(E) Evans, J. L., "Error and the Will," *Philosophy* (April 1963).

(HR) *The Philosophical Works of Descartes*, ed. Haldane and Ross (Cambridge: Cambridge University Press, 1931).

(K) Kenny, Anthony, "Descartes on the Will," *Cartesian Studies*, ed. Butler (New York: 1972).

(O) O'Hear, Anthony, "Belief and the Will," *Philosophy* (April 1972).

(T) Tlumak, Jeffrey, "Judgment and Understanding in Descartes's Philosophy," this journal, this edition.

(WB) Williams, Bernard, *Descartes: The Project of Pure Inquiry* (London: 1978).

(WM) Wilson, Margaret, *Descartes* (London: 1980).

NOTES

[1] All references are to works listed in the bibliography.

[2] Commentators disagree on whether Descartes actually adopts this claim; see my "Clear and Distinct Perception and Metaphysical Certainty," *Mind*, 1978 for an argument in favor of attributing it to Descartes.

[3] Another point deserves attention here. Which question do such commentators as Kenny, Caton, Williams and Wilson intend to answer? Are they and Tlumak all giving alternative answers to the same question?

[4] A more complete discussion of externalism can be found in D. M. Armstrong's, *Belief, Truth and Knowledge* (London: 1973) and Laurence Bonjour's "Can Empirical Knowledge Have a Foundation," *American Philosophical Quarterly* (January 1978).

[5] I discuss these two kinds of certainty and their place in Descartes's philosophy in "Dreams and Deceivers in Meditation One," *Philosophical Review* (April 1981) and "The Cogito Puzzle," *Philosophy and Phenomenological Research* (Sept. 1982).

[6] A detailed and insightful discussion of the different roles played by clear and distinct perception in Descartes' knowledge of foundational and nonfoundational propositions is James Van Cleve's "Foundationalism, Epistemic Principles and the Cartesian Circle," *Philosophical Review* (January 1979).

Part VI
God

[15]

The Problem of the Third Meditation

by Stephen Menn

I

My aim in this paper is not to give a reading of the third Meditation, but only to motivate one strategy for reading it, which I have developed in detail elsewhere.[1] The third Meditation is a difficult text, and this difficulty often leads readers to focus their attention on the first two Meditations, whose arguments are not hostage to the strange terminology and dubious principles of the third; the third Meditation is then read as an attempt to overcome problems posed by the results of the first two Meditations. Here I will be asking what problem Descartes was trying to solve in writing the third Meditation: if my conclusions are right, then this Meditation must be read, not as a response to the sceptical challenge of the first Meditation, but as the original core of Descartes' plan for a metaphysics. It is therefore a mistake to interpret the first Meditation by itself, and then the third through the first: the first Meditation must be understood through the third, and the third through Descartes' project of turning an old metaphysics into the foundation of his new science. I will not be able to discuss the third Meditation's arguments in any detail here, but I hope to say enough to motivate the detailed reading that I have given elsewhere, or to stimulate the reader

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[1] The interpretation of Descartes that I sketch here is developed in full in my *Descartes and Augustine* (forthcoming, Cambridge University Press), a revision of my 1989 University of Chicago dissertation of the same title. I discuss the third Meditation in chapter 6 of the book (chapter 3, section B of the dissertation). I will give footnote references to chapters of the book where I discuss topics in further detail, adding in parentheses corresponding sections of the dissertation. (The chapter divisions of the book remain somewhat tentative.) The present paper is a heavily revised version of a colloquium talk I gave at Illinois Institute of Technology in February 1987, and subsequently to other audiences. The main difference is that in the present version a higher percentage of the sentences are true. I am grateful to everyone who has helped bring that about.

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to work out the details for himself, giving due attention and respect to arguments that have been too easily dismissed.

The arguments of the third Meditation have been dismissed, not just because they are thought to be bad, but because they are thought to be an *ad hoc* construction, out of materials wholly inadequate to the problem they are called on to solve. The first Meditation insists that any real knowledge must be so firm that it cannot be called into doubt by any line of reasoning whatever; and by this standard, Descartes concludes that we do not really know any of the things we customarily consider certain, not even that 2 + 3 = 5, or that there is an external world. The third Meditation, however, gives an elaborate proof of the existence of God, based on principles expressed in complex terminology and justified only by appeal to the "natural light of reason," which has failed to convince most philosophers then or since. Descartes offers this proof as the sole support for an infallible system of knowledge: he considers that he knows the existence of an external world, or the truths of mathematics, only when he has derived them from the existence of God. The problem that the third Meditation immediately poses is this: why, after first insisting that the sciences must be absolutely certain, does Descartes then base them all on a single, apparently weak argument, claiming this to be more reliable than the senses, and more certain than mathematics?

The usual answer runs roughly as follows: Descartes was concerned with the sceptical challenge to knowledge. He accepts the sceptical contention that knowledge is not knowledge if its foundations are doubtful, and he recognizes that the sceptical arguments, if pushed to their logical conclusion, cast doubt on the evidence of the senses and even on mathematical reasoning. Descartes finds that he can really be certain only of his own thoughts. In trying to find an argument to get him from his thoughts to the external world, he hits on the plan of arguing that his idea of God requires that God actually exists; he can then use the existence and goodness of God to argue that God would not let his creatures be deceived in any radical way. Although the argument for the existence of God is not impressive, Descartes clings to it, and convinces himself of its validity, because he thinks it is the only possible escape from the sceptical conclusion that knowledge is impossible.

I will argue that Descartes' plan of basing knowledge on this argument through God is *not* a mere reaction to scepticism, but that it reflects a definite conception of God, which Descartes had inherited from earlier thinkers and in particular from Augustine; and that given this conception of God, it would be reasonable and natural for Descartes to try to base the sciences on God, and on precisely this argument for the existence of God. I will try to show that the argument of the third Meditation arose directly out of Descartes' conception of God, and that the arguments of the first Meditation were constructed afterwards, to highlight this conception of God and establish it as the universal first principle of the sciences.

It is true that Descartes came to the strategy of arguing through God by observing the failure of a project for knowledge without it; but what he came to in this way was not an *ad hoc* argument, but a systematic vision of a science based on the Augustinian conception of God. We can observe the process by which Descartes came to this vision of science if we first examine an earlier version of his scientific project which does not use the idea of God. By comparing Descartes' first sketches for his science with the mature version presented in the *Meditations* and *Principles*, we can understand why the early project failed, why Descartes turned to Augustine's conception of God to help him out of his difficulties, and finally how the attempt to base science on this conception of God led him to construct the *Meditations* in the way he did, leading both to the apparently wild scepticism of the first Meditation and to the apparently wild dogmatism of the third.

II

From the time of his vocational dreams in 1619, Descartes believed that he could construct a universal science out of a few simple truths which were naturally contained in every human mind, and which needed only to be made explicit and developed into a systematic body of knowledge.[2] In the collection of early notes published posthumously as the *Rules for the Direction of the Mind*, Descartes offers a sketch of how any given problem will be solved: we will "reduce complex and obscure propositions step by step to simpler ones, and then try to ascend by the same steps from the intuition of all the simplest things to a knowledge of everything else" (AT X, 379). So Descartes believes that if he can collect an intuitive understanding of all the most basic objects of thought, and learns to reduce any problem to a question about these simplest things, he will be able to develop his intuitions into a universal science.

What are these simple objects of thought, and the simple truths that are to be intuited about them? Descartes does not fully answer this in the *Rules*, but he is *not* thinking of the series of intuitions of the mind, God, and body which he will propose in the *Meditations* as the true foundations of science. It seems from Rule 4 that Descartes initially

[2] Descartes' dreams are reported in Adrien Baillet, *Vie de M. Descartes* (1691), v.1, 80-86, on the basis of a (now lost) manuscript of Descartes entitled *Olympica*; this text of Baillet is reprinted at AT X, 180-88. I translate the crucial portion of this text, and discuss the dreams and their implications for the history of Descartes' scientific project, in *Descartes and Augustine*, chapter 2 (dissertation, introduction, section C). I cite Descartes by volume and page numbers of the edition of Adam and Tannery (AT).

conceived his universal science as a "universal mathematics" or science of quantity in general: the simplest idea would then be *quantity*, and by understanding the relations between quantities we could build up to a knowledge of all particular quantified things, "whether numbers or figures or stars or sounds or any other object" (AT X, 378). At this early stage Descartes shows great excitement over this plan for a universal mathematics more basic than the current disciplines of arithmetic and geometry; he thinks that he has rediscovered the secret analytic method of the ancient geometers, and that by using it he will be able to solve the problems of the particular mathematical sciences.

Descartes met with success in his mathematical project; but when he tried to apply this mathematics to solve physical problems, he made the inevitable discovery that something more than mathematics was needed. He shows how mathematics is insufficient in Rule 8, in trying to analyze the problem of finding the "anaclastic line," the curve through which parallel incoming light rays are refracted to focus on a single point. This can be reduced to the problem of finding the relation between the angle of refraction and the angle of incidence, but "someone who only studies mathematics" can go no further (AT X, 393). Many laws of refraction are mathematically possible, and the mathematician cannot decide which is correct. Admitting his ignorance of this simpler problem, he must give up on finding the anaclastic line.

Someone who does *not* only study mathematics might be able to solve the problem, but only if he could reduce it further to some simple question which could be grasped by an intuition outside the realm of pure mathematics. Descartes suggests that the appropriate thing to grasp would be "what a natural power is in general" (AT X, 395), but he does not say how we can come to know this, or what the content of this knowledge might be.

Descartes recognizes that he must reassess what, outside of pure mathematics, the mind is capable of knowing: those who love the truth, he goes on to say, must begin by asking "what human knowledge is, and how far it extends" (AT X, 397-8). To approach this question according to the method, we must begin by enumerating the faculties which can lead us to knowledge and simple objects which are to be known. Once we have established these principles we will be able to determine whether a given problem is solvable or not, and if it is solvable we will know what sources of knowledge to refer it to. If we neglect the question of our sources of knowledge and the objects to which they are adequate, we are likely to waste our time in puzzling over "arcana of nature" (AT X, 398) that we are in no position to understand.

In the remainder of Rule 8, Descartes outlines what we would have to study in order to answer the question about knowledge and reality. In Rule 12 he tries actually to answer it by giving a systematic discussion of our faculties and of the objects of knowledge. We are interested particularly in his discussion of the faculties, because it is here that serious difficulties arise. Descartes distinguishes four cognitive faculties: intellect, sensation, imagination and memory [of sensible things]. Only intellect can *know* anything, but it cannot know much unless it makes proper use of the other three faculties. Descartes would like to demonstrate, in proper order, what each of these faculties can do and how it should be used; but he cannot.

> I would have liked to explain in this place what the human mind is, and what the body, how the latter is informed by the former, what faculties there are in the composite whole which serve to know things, and what each of them do; except that [this place] seemed too small to include everything which must be set out beforehand, before the truth of these things can be made clear to everyone. For I want always to write in such a way that I assert nothing about the things which are commonly drawn into controversy without setting out beforehand the reasons which led me to it, and by which I judge that others can also be persuaded (AT X, 411-2).

Descartes cannot prove what he wants about the faculties without first establishing a full theory of human nature (and a theory rich enough to have normative teleological implications for the function of our faculties), and he cannot do this without full theories of bodies and of minds; but he is supposed to be establishing what we can know *before* undertaking detailed work in the sciences.

Descartes gives an outline account of the faculties anyway, but he admits that it is based on an unproved hypothesis (AT X, 412). Basing himself on a mechanical theory of nature, he suggests how the impressions of the different senses, the common sense, the imagination and the memory might arise through the communication of motion through the nervous system (AT X, 412-15). The intellect is incorporeal, and stands outside this mechanical system; Descartes says that it can think either by itself or by using the sensory faculties (AT X, 415-16), but he discusses neither the nature of the intellect, nor how it thinks by itself, nor how something incorporeal can make use of the senses. Descartes offers some general advice about when the intellect should make use of the sensory faculties: since the imagination is corporeal, it is useful when dealing with bodies but a hindrance when dealing with incorporeal things (AT X, 416-17).

Descartes hopes that this advice will be useful, even though it is based on a hypothetical understanding of human nature. But it cannot fulfill the role in the method that he wishes it to. Descartes is not able, in describing the faculties, to show how or to what extent they can succeed in reflecting reality, as he must do if the account of the faculties is to answer the question about the human capacity for knowledge. He can give a criterion for the right and wrong use of the faculties only in terms of the general theory of human nature; and this is circular in a vicious sense, since Descartes' theory of human nature is not the standard account in his time, but is based on the mechanical hypothesis which he wants to establish by his method. Descartes is offering a package deal of psychology and physics which will have no persuasive force for an Aristotelian or other non-mechanist scientist. It seems, then, that psychology cannot serve as a basis for Descartes' universal science any more than mathematics can.

Descartes abandoned the *Rules*. He left them in very rough form, and made no attempt to publish them during his lifetime.[3] We have seen some of the internal difficulties of the project. It seems that Descartes was persuaded that he could not resolve them within the method envisioned in the *Rules*. The idea of a universal scientific system is still there guiding his later, published writings, but it is in a significantly different form.

Sometime in 1628 Descartes seems to have stopped work on the *Rules* and to have begun what he would regard as the construction of his "philosophy" proper, starting from first principles and building upwards.[4] It was also in the fall of 1628 that Descartes met Cardinal de Bérulle, the Augustinian mystical theologian and founder of the French Oratory. Bérulle, impressed by an exhibition of Descartes' "method," spoke privately to him about it, and "made it an obligation of conscience for him" to work out his thoughts into a full philosophy for the benefit of mankind rather than applying his method piecemeal to mathematical exercises. Descartes also says in the dedicatory letter of the *Meditations* (AT VII, 3) that "some persons" who knew that Descartes had developed a method for resolving scientific problems "demanded in the strongest terms" that he apply it to proving the existence of God and the distinction between mind and body. Despite the plural, it seems clear that this also is a reference to Bérulle.[5] Descartes took up the challenge, retreating to isolation in Holland and "the first nine months that I was in this country, worked on nothing other" than metaphysics, discovering the foundations of physics in this way (AT I, 144). From this time on Descartes always regards metaphysics, not mathematics or psychology, as the basis of his science: he had found in metaphysics a way around the foundational difficulties of the *Rules*. If Bérulle told Descartes to prove the existence of God and the immateriality of the soul, he was telling him not just to do philosophy but to do metaphysics; and it would be natural for Bérulle to suggest Augustine as a model. It is clear, in any case, that about this time Descartes turned to Augustine's central metaphysical ideas and made them the starting point for his new philosophical project. It is also clear that, whatever the external stimulus, Descartes adopted these ideas because he thought they could give a solution to the internal difficulties of his project. To see how they could serve this function, we will first examine what Augustine's basic ideas were and how they helped to solve the problem of the *Rules*. We will see that this discovery led Descartes naturally to the plan of the *Meditations*.

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[3] A striking sign of the abandonment of the *Rules* (beyond the obvious fact that Rules 19-21 are only headings and that the work was certainly intended to go further than this) is the incoherent state of Rule 8. Descartes apparently announces three separate times in AT X, 395-8 that we must investigate the scope of our cognitive faculties. Twice (bottom of 395 and top of 396, and again bottom of 398) he says that only the intellect can properly *know*, but that it can make (good or bad) use of the other faculties in knowing. And while the first of these passages says that there are only *two* such faculties, imagination and sensation, the second passage says that there are *three* such faculties, imagination and sensation and memory (since this is strictly sensory memory, Descartes had probably intended the first time to count it under imagination). Clearly what we have here (and in connected passages of Rule 12) is a series of starts at treating the material Descartes thought he needed at this stage in his project. He seems not to have been satisfied with any of them, and certainly he never went back over what he had written to impose consistency and eliminate repetitions and false starts, because he had given up on the whole project of the *Rules*, although not on the project of **a universal science.**

[4] See Descartes' brief description of this second great turning point in his life (after the mathematical discovery and dreams in 1619) at the end of the third part of the *Discourse on the Method*, AT VI, 30-31. He had given a compressed and cryptic account of the *Rules* and of the mathematical project they reflected in the second part of the *Discourse*, dating this work during the nine years before his departure for Holland (1619-1628).

III

Augustine gives us in *Confessions* III-VIII a retrospective account of how he came to accept the Christian faith. He had, he tells us, been attracted to Christianity for a long time, but a number of difficulties had prevented him from committing himself to it fully. Chief among these difficulties was an inability to understand where evil could come from if, as the orthodox Christians maintained, the world were ruled by a single, beneficent and omnipotent God. Since evil obviously exists in the world, Augustine felt compelled to suppose, with the Manichees, that it arose from some foreign source outside the control of the good God, and that God was therefore limited in this respect. Augustine says in retrospect that the source of his inability to understand the origin of evil was an inability to understand God properly. Once he had learned the right way of thinking of God, he was able to resolve his difficulty about evil, and thus to eliminate the principal intellectual obstacle to his conversion to Christianity. He did in fact convert only months after he discovered what he decided was the solution to the problem about God and evil.

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[5] For the very interesting story of Descartes' encounter with Bérulle, see Baillet, *Vie de M. Descartes*, v. 1, 160-65. I discuss this encounter and its implications, and the parallel with the dedicatory letter of the *Meditations* in *Descartes and Augustine*, chapter 2 (dissertation, introduction, section D).

After his conversion Augustine decided that it was his task to spell out his understanding of Christianity for his own benefit and the benefit of others who had similar intellectual difficulties with Christianity. Thus in numerous works, including the *Confessions*, he describes the process by which he came to an understanding of God and the conclusions which this led him to about God and about other things, including the origin of evil. Augustine's way of understanding God and his relation to other things was taken up by later thinkers and became a major strand in the history of Christian thought. It was this understanding of God which came to Descartes' attention sometime around 1628, and which seemed to him to provide a solution to his problem about foundations, a very different problem from the one which had originally led Augustine to work out this understanding of God.

Augustine gives the best description of the mental process which led him to understand God in *Confessions* VII. He tells us that he had been given some "books of the Platonists" (*Confessions* VII, ix, 13), books by Plotinus and perhaps his disciple Porphyry, and that what he read in these books (together with the grace of God) led him to perform a series of intellectual operations whose ultimate fruit was an understanding, or (as Augustine says) a vision, of God.[6] Augustine says that, following the advice of the books of the Platonists, he first "entered in to his own innermost parts," and then "by some kind of eye of my soul I saw above that same eye of my soul, above my mind, an immutable light," which he distinguishes sharply from the kind of light visible to the eyes of the body. "Nor was it above my mind as oil is above water or as heaven is above earth, but it was above because it had made me, and I was below because I had been made by it" (VII, x, 16). To translate this into more conventional philosophical terms, Augustine begins by intuiting his own soul, and then this first intuition somehow allows him to come to an intuition of God. Augustine says that this procedure led him to a knowledge of God very different from the conjectures he had previously formed, and that with this knowledge of God he could understand whence evil arose.

It is not immediately clear how "entering into" his own soul could help Augustine conceive God in a way he could not before, but we can understand what Augustine discovered if we compare his description of his new conception of God with his descriptions of his earlier ways of thinking. Augustine says that the principal reason why he had fallen into error was his inability to conceive of anything except bodies extended in space. Wishing to conceive of God in the most appropriate way, he could only imagine him as an infinite body interpenetrating all other bodies, and he imagined his own soul as a small fragment of this infinite body. But when he "enters into his own innermost parts," he is not considering how much room his body or his soul may take up, but only his own thoughts. This reflection on himself leads him to recognize that some of his thoughts are in accordance with truth or wisdom, and that some of them run contrary to truth. He therefore recognizes that there must be some such thing as truth, which sets the standard for whether he is thinking rightly or not. Augustine identifies the light which he perceives above his mind with this truth. When he sees it he is coming upon the "immutable and true eternity of truth above my mutable mind," as he says further on (VII, xvii, 23). When he has seen this truth, he asks himself, "Is truth nothing, [simply] because it is not spread out either over finite or over infinite spatial extensions?" He finds that he cannot doubt that it is something: "and I would more easily have doubted that I was alive than that this truth existed" (VII, x, 16).

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[6] For a discussion of the "books of the Platonists," see *Descartes and Augustine*, chapter 3, section A (dissertation, chapter 1, section A. 1). Much of what I will attribute to Augustine here is in fact originally Plotinian; but I will not need to refer to Plotinus in what follows, although this would be important for a deeper study of Augustine. I will cite two of Augustine's works, the *Confessions* and the *On Free Will (De Libero Arbitrio*, abbreviated DLA), by their book, chapter, and paragraph numbers as given in the Benedictine edition.

Identifying God with such a "truth" gives Augustine a way of conceiving him as incorporeal, and it also allows him to solve his problem about the origin of evil. Augustine's problem had never been a moral objection against God based on the existence of evil, but a genuine bewilderment as to where it could come from. His particular problem had been about the origin, not of *natural* evil (what causes earthquakes?), but of *moral* evil or sin, which exists and yet cannot arise from God.[7] When he thought like a Manichee he could not answer this, because he thought that the soul was a fragment of God and could not be the source of anything contrary to the divine goodness; evildoing had then to come from some foreign source. Now he can say that since the relation of God to the soul is not the relation of the whole to the part but the relation of the measure to the thing measured, there is no contradiction in supposing that the soul may sometimes deviate from its proper measure and so produce evil without the goodness of the measure itself being endangered.

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[7] So at the beginning of the *On Free Will*, when Evodius asks whether God is the author of evil, Augustine distinguishes two ways that we speak of evil, "once, when we say that someone has suffered some evil [*mali aliquid esse perpessum*]" (DLA I, i, 1); Augustine says that God is the author of the second kind of evil (when he justly punishes evildoers), but cannot be the author of the first kind. The origin of the first kind of evil, *moral* evil, is the real problem, and this is what the dialogue will be about. Augustine makes a similiar distinction at *Confessions* VII, iii, 5.

At this point, while we will surely grant that truth is not a body and that it is not a homogeneous whole containing the soul as a part, we may suspect that we no longer understand what Augustine meant by "truth." Augustine's "truth" cannot be simply a property of sentences or of judgments, since it is something that we *look to* in judging, and that serves as a standard for whether our judgments are true; nor is it simply the totality of real things (including bodies) that we make judgments about, since it is a "wisdom" ideally exemplifying what our judgments should be and illuminating things so that we can judge them. But why should we think that there is such a truth beyond what is in souls and bodies? Augustine does not suggest that it is obvious simply from the meaning of the word "truth" that there is such a thing. He has himself reached direct intuitive knowledge that it exists; but he wants to bring his readers to share this knowledge, both so that they can understand God as he is (as far as possible in this life), and so that they can resolve their difficulties about the origin of evil. In Augustine's dialogues, and especially in *On Free Will*, he tries to help direct our mental vision toward this "truth" by arguments designed to show us that there is a truth above the soul, and that it is as Augustine describes it.[8] The *On Free Will* first argues at length that God exists and is the source of all good things, then draws the consequences for free will and the origin of evil. Augustine argues that God exists by leading us up along an ascending series of realities: first, bodies exist; animals have senses which pass judgment on bodies and an inner common sense which passes judgment on the five external senses; human beings also possess reason, which can pass judgment on all the earlier terms of the series (DLA II, iii, 7-vi, 13). Augustine argues that each of these realities is superior to what it passes judgment on, so that the human mind or reason is the greatest of them all. He argues further that if there is some one thing, beyond the many individual souls, which human reason uses as a standard to pass judgment on other things and on itself, this will be superior to everything in bodies and souls, and either it or whatever is greater than it (if there is anything greater) will be God. Augustine then argues that there is such a standard, arguing both from the "rules of number" and from the "rules of wisdom," where these are chiefly comparative judgments of value, like "the immutable good should be preferred to the mutable." Since the rules of wisdom yield *normative* judgments ("we often say not only that they *are* this way and not that way, but also that they *ought to be* this way and not that way," DLA II, xii, 34), and since the bodies that we judge do not perfectly exemplify these standards, we must have learned them from contemplating something superior. The rules of wisdom are superior to minds too, since we judge that minds *ought* to be wise, i. e., ought to conform to the rules of wisdom, but not that these rules ought to conform to our minds. The "rules of number" too cannot come to us from bodies, since bodies contain no perfect unities, and since we can know universal theorems about *all* numbers, which we could not have learned from sensory observation.[9] Since these rules have not come into our mind from bodies, nor into bodies from our mind, they must exist in an independent truth which supplies knowledge to our minds and also supplies mathematical order to bodies. This truth, containing the rules both of wisdom and of number, Augustine identifies with God.[10] And since bodies and souls both receive their respective perfections from this source, Augustine takes his argument as showing also that God is the source of all good things.

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[8] For an extended discussion of Augustine's strategies for "ascending" to knowledge, first of the soul and then of God, and for the consequences Augustine draws for God's nature and his relations to other things (and, in particular, for the nature and origin of evil) see *Descartes and Augustine* chapter 4 (dissertation, chapter 1, section B). Augustine is relying heavily on Plotinian models of "ascent" to soul and Nous (not, as often stated, to the One), and often what he is saying can be clarified only by comparison with Plotinus. See *Descartes and Augustine* chapter 3 (dissertation, chapter 1, section A).

In *Confessions* VII, a few chapters after the initial description of the vision of truth, Augustine gives a brief description of his strategy for searching for God, which nicely captures the central point of the baroque argument of the *On Free Will*. Augustine had long been certain that the immutable was better than the mutable, and therefore that God, whatever he might be, had to be immutable. But now, he tells us, he tries to seek the immutable God by "seeking *whence* I approved the beauty of heavenly or earthly bodies, and what was present to me when I judged rightly about mutable things and said, 'this ought to be this way, that ought not to be that way'" (VII, xvii, 23), that is, by seeking the immutable in the *source* of his knowledge of the intelligible standards of things. By seeking in this way, he was able to find what he had been looking for: "seeking *whence* I judged when I judged in this way, I found the immutable and true eternity of truth above my mutable mind" (ibid.). To show how he did this, he first recapitulates the process of ascent from bodies to the mind or reason, each stage of which brings him closer to the immutable God. He then describes the final ascent which takes the mind from considering itself to considering God:

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[9] For the argument that we cannot come to know numbers through the bodily senses because bodies do not contain perfect unities, see DLA II, viii, 22. For the argument that, even if the senses gave us knowledge of numbers themselves, they could not give knowledge of theorems about *all* numbers, see II, viii, 23 (also II, viii, 21, the senses could not show us the *ratio* of arithmetical operations).

[10] Augustine describes the relation between wisdom and number, proceeding from the same divine source, by an extended metaphor. "As in a single fire brightness and heat are perceived to be (as it were) consubstantial, and cannot be separated from each other, and yet heat reaches [only] to those things which have been brought near to the fire, while brightness is spread further and more widely, so the things which are closer to wisdom (as are rational souls) are heated by the power of intelligence, while the things which are further away (as are bodies) it does not touch with the heat of wisdom, but floods with the light of numbers" (DLA II, xi, 32). I accept the variant reading "*intelligentiae potentia, quae sunt sapientiae propinquiora*" instead of the usual "*intelligentiae potentia, quae inest sapientiae, propinquiora*"; but the difference in meaning is not great.

> this [power of reason], recognizing that it too in me was mutable, raised itself up to its own understanding and withdrew my thought from its habits, taking itself away from the contrary crowds of images, in order to find what light was shining upon it when it proclaimed without any doubt that the immutable was preferable to the mutable, [a light] whence it knew the immutable itself—for if it did not somehow know the immutable, it could not have preferred it for certain to the mutable (ibid.)

That is to say: although the mind recognizes that it is mutable and imperfect, it is also true that in that recognition it must implicitly have knowledge of an immutable standard of comparison; and asking for the source of this knowledge, it sees that this knowledge could only have come from the immutable being which it has been seeking. Augustine says: "and in the twinkling of an eye it [his reason] arrived at *that which is*" (ibid.).

This ascent from the soul to God gives the core of Augustine's method for making God intelligible to us; and it is, of course, also the core of the third Meditation. It is clear why Augustine's procedure would appeal to Descartes. To solve his foundational problem in the *Rules,* he needed a standard for the truth of the soul's thoughts that would be independent of any prior understanding of bodies. But Augustine shows how, if you start by withdrawing your thoughts into yourself, you can rise to an understanding of God that makes no reference to bodies; and Augustine understands God precisely as a standard determining whether the soul's thoughts are true or false. Of course Augustine does not try to use his understanding of God to gain knowledge of the physical world. But if we first understand the soul and its relation to God as its creator and its source and standard of knowledge, then we can try (without assuming any physics) to take up the task of Rule 12, assessing the functions of each of our faculties and what they can contribute to knowledge. In particular, if the same divine truth makes knowledge of mathematical rules accessible to our reason and also imposes these rules on bodies, then we can come to know bodies, not just *from* the bodies causally influencing our senses, but in the first place from God as the light of our reason. Augustine tries to lead us up from wisdom in souls and from number in bodies to God as their joint source. Descartes will take us up from souls to God and then down again from God to the bodies he makes intelligible.

IV

The *Meditations on First Philosophy* or *Metaphysical Meditations* are intended to give the reader that knowledge which, in Descartes' mature opinion, is the foundational science from which the whole system of science can be derived. First philosophy or metaphysics in Descartes' use of the terms is concerned with God and the soul. Descartes thinks that these must first be known, and then the knowledge of other things will follow.[11] Indeed, he says in the introductory Synopsis of the Meditations that just this is the thesis of his work: "I took the proof of this one thing as my goal in these Meditations," that even the truths "that there is a world, that men have bodies, and the like, which no one of sound mind has ever seriously doubted" are "neither as firm nor as clear as those by which we come to know our mind and God; so that these [latter] are the most certain and evident of all things that the human mind can know" (AT VII, 16). The six Meditations argue in several ways that God and the soul are better known than bodies: the first Meditation argues that unless God and the soul are known first, bodies cannot be known; the second and third Meditations argue that God and the soul can indeed be known in a way that does not depend on knowing bodies; and the remaining three Meditations argue that from this knowledge of God and the soul a knowledge of bodies can indeed be derived.

The knowledge of God and the soul which Descartes presents in the second and third Meditations is simply a fleshed-out version of Augustine's vision as presented in the passages we have cited from the *Confessions*. Sometime between the abandonment of the *Rules* and the composition of the *Meditations*, Descartes has decided that the Augustinian method of knowledge of God and the soul is the way to knowledge of the physical world. The thesis of the *Meditations* is that this foundational science yields knowledge of bodies, and that nothing else can do so.

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[11] For basic truths about God and the soul as Descartes' "principles of immaterial or metaphysical things" and as the first principles of all philosophy, see AT IX2, 10. At AT III, 235, Descartes distinguishes "metaphysics" and "first philosophy" in such a way that metaphysics would be a particular treatment of God and the soul, while first philosophy would be a general treatment of "all the first things one can know in philosophizing." Because the fifth and sixth Meditations go beyond God and the soul to treat the principles of physics (the essence and existence of bodies), Descartes prefers the title "Meditations on First Philosophy." The French translation was nonetheless called "Metaphysical Meditations," and Descartes seems not to have objected.

In the second Meditation Descartes "withdraws the mind from the senses" and reflects on himself. He goes on to discuss the knowledge of himself which he obtains by reflection, that he exists as a mind or thinking thing, and argues that this knowledge is more certain than any knowledge he can have about bodies, since whenever the mind passes judgment on a body, it is more certain that it is judging than that the body in question really is as it is judged to be. In the third Meditation Descartes discusses the idea of God as an infinitely perfect being, an idea which he thinks must implicitly be present, as the standard by which we measure perfection, in our judgment of ourselves as beings of limited knowledge. Descartes argues that we could derive this idea of a perfect God above our minds only from a perfect God actually existing above our minds. In this whole procedure Descartes is following the lines laid down in Augustine's description of the soul's withdrawal into itself and its ascent to knowledge of God. In particular, Descartes follows Augustine in showing that we can distinctly conceive God by conceiving him as the immutable standard for our mutable mind (rather than, say, by conceiving him as a creator of the world), and in proving the existence of God as the cause of this conception in our minds (rather than as the cause of the world). Descartes goes on in the fourth Meditation to explain the origin of error in judgment just as Augustine explains the origin of sin (and indeed this Meditation closely follows the argument of Augustine's *On Free Will*),[12] and concludes with Augustine that as long as we follow the divine standard and do not depart from it by an act of will, we will not go wrong. Descartes argues that the clear ideas of pure intellect, which (unlike sensory ideas) have a positive objective content, receive this content from God, the source of truth (AT VII, 62), while obscure ideas with no positive objective content may "proceed from nothing," existing in me from no positive source but only from my deficiency compared with the divine standard of knowledge (AT VII, 44). So Descartes resolves to separate the clear ideas sharply from the obscure ones, and build his science only on the former. In physics this means that we must understand bodies through the intellectual concept of geometrical extension and not through what the senses appear to tell us about their nature.

At this point it is natural to object that while Descartes is borrowing Augustine's method for conceiving God and the soul without reliance on any understanding of bodies, and while Descartes tries to use the knowledge of God so obtained to get around his foundational difficulty in the *Rules* and justify a physics based on geometrical extension, this background cannot explain the most distinctive feature of the *Meditations,* namely that they begin with the extreme sceptical arguments of the first Meditation, which occur neither in the *Rules* nor in Augustine. But we can understand this feature of the *Meditations* as well, if we think about how Descartes wants to use what he takes from Augustine, and how he wants to set his mature program off from the program of the *Rules.*

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[12] On the relations between the fourth Meditation and the *On Free Will*, see *Descartes and Augustine* chapter 7, section A (dissertation, chapter 2, section B), and my article "Descartes, Augustine and the Status of Faith" (forthcoming in *Studies in Seventeenth Century Philosophy, Oxford Studies in the History of Philosophy* v. 2, ed. M. A. Stewart).

It is Descartes' ambition, in all versions of his program, to build a comprehensive science on simple truths evident to the mind, and on such truths *alone.* He wishes to exclude the pre-reflective prejudices which have been admitted into science and have made it untrustworthy in the past. By inducing his readers to withdraw their assent from everything that is not genuinely evident and then to accept the fundamental intuition (whether this is mathematical as in Rule 4, psychological as in Rule 12, or metaphysical as in the *Meditations*), he will prepare them to build up their knowledge on this basis, accepting their old opinions back only if they can be deduced from rational first principles.

Descartes takes Augustine's intuition of the soul and God as giving him the rational first principle from which all knowledge can be deduced. Whereas Augustine had used it to argue that sin was voluntary deviation from the divine standard, and thus to point out the possibility of living well, Descartes wants to argue that *error* is a voluntary deviation from the divine standard, and thus to point out the possibility of *judging* well and so building up the sciences. If God is the source and standard of truth, a conception will be true if it derives from him. Descartes wishes to persuade us to accept every conception which we know to be from God and to reject every other conception. The first stage of the project of the *Meditations* is to prove that we do not know anything until we know that it comes from a God who is known as the source of truth; and this is what the first Meditation is designed to accomplish.

The first Meditation gives a number of reasons to show that our habitual beliefs are doubtful. These reasons build up until Descartes reveals the most serious reasons, reasons which cast doubt universally on all the beliefs we could form before we come to the knowledge of God as the source of truth. If we do not know our creator, says Descartes, we are in a dilemma: either we are the products of an omnipotent God, or else we have come to be from more limited causes, "from fate, or from chance, or from a connected series of events, or in some other way" (AT VII, 21). If we were created by an omnipotent God, then "how do I know that he has not brought it about that there is no earth at all, no heaven, no extended thing, no shape, no size, no place, and yet that all these things should *seem* to me to exist, just as they do now" (ibid.)? Indeed, how do I know that he does not deceive me even in the things I *think* I most clearly perceive to be true, such as the truths of mathematics? There is, of course, a view that God is good and is the source of truth rather than of deception. This is precisely how Descartes will argue later, but his point is that we can only argue in this way once we have known that God is the source of truth, and that we can have no certainty until we know this. The other horn of the dilemma remains as a possible way out of this conclusion: perhaps we and our thoughts are the result of natural processes and there is no God to deceive us. But Descartes argues that this is no better and that if this is really the case we can have no certainty at all. "Since being deceived and erring seems to be an imperfection, however much less powerful they make the author of my origin, it is that much more likely that I will be so imperfect that I am *always* deceived" (ibid.).

The two arguments are presented in the first Meditation as having equal status. If I am created by an omnipotent God and I do not know that he is the source of truth, then I can have no certainty; but if I am produced by natural forces, then I still can have no certainty. Together they support Descartes' conclusion that the knowledge of ourselves as creatures of a God who is the source of truth is the only way to science. Nonetheless, the first argument has fascinated subsequent philosophers, while the second argument has been neglected. This is because the first argument is more dramatic and holds the imagination much better. Descartes knew this, and this is why, when at the end of the first Meditation (AT VII, 22-3) he designs an exercise to keep the reader from forgetting the reasons for doubt, he does it by expanding the argument from the deceiving God into the hypothesis of the evil spirit [*malignus genius*]. Nonetheless, the second argument is deeper, and Descartes intended it as his main argument against trusting the senses.

We can understand why the second argument is important to Descartes if we compare the project of the *Meditations* with the psychological project of Rules 8 and 12. That project aimed to construct a science by beginning with the cognitive faculties of the human soul and determining the objects they could know by considering their functions within the human composite. By the time of the *Meditations* Descartes has rejected this project. He is now convinced that we can know that something is true only by referring it to the divine standard. The most that psychological investigation can show is that we are designed by nature to believe the reports of some faculty. That would show only that the belief is natural, not that it is rational or true. To show this we must derive the belief from God as the source of reason and truth. Descartes does not believe that "nature" in the true sense has designed us to believe falsehoods (cf. AT VII, 80); but we cannot base our science on what nature tells us to believe until we know what really comes from a rational nature and what comes from irrational habit. And we can only know what nature is when we have tested it against a criterion which we immediately know to be rational. Otherwise we are trying to learn about nature by discovering what nature tells us to believe about nature, and we are caught in the vicious circle of Rule 12. If we start from a sensualist conception of nature we will never escape from believing that we are designed to conceive nature through the senses. For this reason, Descartes feels that it is necessary to begin by calling nature into question by refusing to accept that everything we seem naturally designed to believe is true, until he can show that our faculties are rational because they are derived from a God who possesses the perfection of rationality in himself and communicates a share of it to us.[13]

The main argument of the first Meditation, then, is directed against accepting a possibly non-rational process of nature as a criterion of truth. It is easy to confirm from Descartes' writings that he intended the argument from the deceiving God or evil spirit to be a mere illustration of this argument. In the Seventh Replies he responds to Bourdin's exaggeration of the scepticism of the first Meditation by telling a parable of an architect and a bricklayer. Descartes is like an architect commissioned to build a chapel, who begins by digging until he reaches bedrock, so that he can lay his foundations in firm ground. Bourdin is compared to a jealous bricklayer who tried to stir up contempt for the architect by saying that the architect intends only to dig a hole and that his plans will never result in building anything. The bricklayer overhears the architect explaining why he must dig by saying

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[13] Early parts of the third Meditation (which I discuss briefly below) make it explicit that Descartes' caution is against our accepting prejudices (especially prejudices about the theoretical validity of our senses) without any rational validation, simply because "I seem to be taught so by nature" (AT VII, 38) or because I have relied too uncritically on the "general rule . . . that everything I perceive very clearly and distinctly is true" (AT VII, 35). As Descartes argues in the sixth Meditation, nature does not teach us falsely, but until we are liberated from prejudice we are easily misled into thinking we are taught something by nature when we are not. At AT VII,38 nature seemed to teach us that our sensory ideas come from things resembling them in reality; but in the sixth Meditation, it turns out that "even if I seem to be taught this by nature, I have really accepted this not from nature, but from a certain habit of judging without consideration" (AT VII, 82). Likewise, as Descartes argues in the fourth Meditation, everything we clearly and distinctly perceive is true; but we are easily misled into thinking that we perceive something clearly when we do not. In particular (as the third Meditation points out, AT VII, 35), the Meditator *used* to think he had a clear *sensory* perception that his sensory ideas came from things resembling them in reality. Even now, when only intellectual perceptions (such as those of mathematics) seem clear, "some god may have placed in me such a nature that I would be deceived even about those things which *seemed* most manifest" (AT VII, 36). This is why we need some independent standard of rationality and cannot simply rely on our initial conception of (our) "nature." These are the reasons why, as the third Meditation argues, we must examine the existence and truthfulness of God before trying to establish certainty about anything else (ibid.). It is important to note that Descartes *never* calls into question the principle that what we clearly perceive is true. As the third Meditation texts especially bring out, he is always careful to challenge only the (false) principle that everything we *seem* to perceive clearly is true, and to query how we can decide which of our perceptions are genuinely clear.

> that the surface of the earth on which we stand is not always sufficiently stable to support great structures; and that sand is especially unstable, because not only does it subside when pressed down by great weights, but also the waters which flow through it not infrequently carry it away with them, resulting in the unexpected collapse of the things it supported; and finally, that when these collapses occur from time to time in the mines, the miners are in the habit of referring their causes to goblins or evil spirits [*Lemures vel malos genios*] who inhabit the places under ground (AT VII, 537-8).

The bricklayer then ridicules this speech and claims "that the architect is so foolish that he is afraid that the earth on which he stands will divide under his feet or that it will be overturned by goblins" (AT VII, 538). But of course this is not the architect's real intention. The evil spirit is simply a dramatic way of representing a natural process which can result in dangerous collapses. The real cause of these collapses is not a malicious power which could support us but chooses instead to make us fall. It is a blind process of nature which cannot do otherwise than it does, and cannot make the ground firm enough to support the weight of our constructions. The case is the same in the first Meditation: the real danger is not that we may be deceived by something which is rational and knows the truth but chooses to keep it from us; the real danger is that we may be depending on a blind natural instinct which, even while it supports the practical reasonings of everyday life, is not strong enough to support abstract scientific constructions. Descartes gives us the argument about the deceiving God or the evil spirit because it presents the danger so much more vividly: as we may walk more carefully in the mines if the image of the goblins has been impressed on our minds, we will likewise be more careful in withholding assent from the senses once we meditate on the image of the deceiving God.

If we put the arguments of the first Meditation in this perspective, we can see how they are intended to relate to the positive argument of the third Meditation. Descartes designed the *Meditations* as a whole around the central idea of God as the source of truth: the third Meditation is an expansion of Augustine's procedure for coming to know God as such a source of truth, and the subsequent Meditations investigate the truths that proceed from this source. The purpose of the first Meditation is to *isolate* this procedure as the only means of coming to knowledge, in order to make the knowledge of God the sole gateway into science. The key argument of the first Meditation makes sense only in the light of what is not stated in the first Meditation but only in the third, namely the positive understanding of God as the source of truth and the consequent rejection of the claims of anything else to produce rationality.

The third Meditation uses the understanding of God as the source of truth, not only to prove the existence of God, but also to begin reconstructing an account of our cognitive faculties and of what they can contribute toward science. The bare fact that God exists does not imply that I am not the plaything of an evil spirit. But the peculiar way that Descartes proves God's existence also shows that God has created me and has given me the intellectual idea of himself. This idea of God is the "craftsman's mark" in me (AT VII, 51), showing that I am not the creature of an evil spirit or of an irrational nature, at the mercy of a succession of thoughts whose production has no necessary relation to whether they are true. Given this knowledge about myself, I can begin to reconstruct the kind of knowledge of my faculties that Descartes had demanded in Rule 12 as a prerequisite for science. The purely rational faculties of intellect and will belong to me insofar as I am created in the image of God, and are not subject to irrational causal influences. The positive stock of knowledge that my intellect contains comes to me from God; and since God is the "source of truth," all this content is true, corresponding to essences that God has established.[14] Any error in my judgments is the result of my voluntary deviation from the rule that God has set up for me to assent only to what I clearly perceive to be true.

This first reflection on our purely rational faculties is not enough to establish a science of physics or of anything beyond eternally possible essences, since the essences of things, as God puts them in my understanding, do not imply actual existence except in the case of God himself. So we are back in the Rule 8 impasse of the "person who only studies mathematics." But now, with the knowledge of God as my creator, Descartes thinks I can also assess the proper function, and rules for the proper use, of the sensory faculties, which the intellect must use to gain knowledge of actual bodies. Once the independence and veracity of intellect have been established, the sixth Meditation reassesses the "nature" which the first Meditation had had to demonize to break us of our uncritical trust in it. The causality of nature is irrational, and no irrational causality can produce any positive intellectual content, which would exhibit to us what some object is in itself. "When I say that I have been taught so by nature, I understand only that I am borne by a spontaneous impulse to believe it, not that it has been shown to me by any natural light to be true" (AT VII, 38). But nature too (once it has been distinguished from our distorted habits of assent) is from God, given not for the mind to perceive what things are in themselves, but to the mind-body composite to impel us to respond practically to our surroundings in such a way as to preserve the composite (AT VII, 80-83). Once the natural faculties (sensation and imagination and memory) have been restricted to their proper function, they are not radically deceptive. And although sensation is given in the first place for practical guidance, the intellect, by reflecting theoretically on the fact that sensation is practically effective, can use it as an instrument in reconstructing a physics. To know what body is in general, we use the intellectual idea of extension, and mathematics shows us the many particular ways in which a body might be extended (how it might be divided into parts of different shapes, how these parts might be moving, and so on). By observing the effects that different bodies have on our senses, we can gain clues about which of the many mathematically possible structures are instantiated within these actual bodies, and so learn more about the physical world than the "person who only studies mathematics" of Rule 8.[15] Indeed, once we have reconceived nature in this way, Descartes thinks we can go beyond the mathematician also in discovering which of the many mathematically possible laws of motion is correct, because we can answer the outstanding problem of Rule 8, "what a natural power is in general." If bodies are merely extension and contain no such active powers as the scholastics imagine, then the only power in them is God himself moving and reordering the bodies he has created. Here again, a science of bodies is possible only on the condition that the single, perfectly rational God governs both our minds and the physical world, in Augustine's words dispensing the "heat of wisdom" to the one and the "light of numbers" to the other. If bodies were governed by a plurality of irrational powers, then different bodies would move in different and unlawlike ways, and we would be unable to solve the problem and grasp the principles of their motions; but since they are moved only by God, who acts in a single uniform way, there is a single constant law of motion governing all bodies, from which (Descartes thinks) we can derive all the detailed patterns of motion we observe in bodies.[16]

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[14] The conclusion of the fourth Meditation says that, because "every clear and distinct perception is doubtless *something*" (i.e., because it has some positive intelligible content), it "cannot be from nothing, but necessarily has God for its author," and therefore (since God is supremely veracious) it must be true (AT VII, 62). What God does in veraciously producing a perception is to create simultaneously the perception and the corresponding thing-perceived (as an essence, not necessarily actually existing). Compare Descartes' letter to Mersenne of 15 April 1630: "it is God who has established these laws in nature, as a king establishes laws in his kingdom; and there is none of them which we cannot understand if we turn our mind to consider it, and they are all inborn in our minds, as a king would inscribe his laws on the hearts of his subject, if he had this much power" (AT I, 145). These laws or eternal truths are the same as the essences of things (cf. the 27 May 1630 letter to Mersenne, AT I,152). On the creation of the eternal truths and its role in Descartes' philosophy, see *Descartes and Augustine* chapter 8, section A (dissertation, chapter 3, section C. 1).

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[15] On the positive function of nature as reconstructed in the sixth Meditation, and on its uses in science, see *Descartes and Augustine*, chapter 8, section C (dissertation, chapter 3, section C. 3).

This sketch of the role of the third Meditation in Descartes' mature scientific project is not yet a reading of the third Meditation. It is not enough to say that the third Meditation takes over Augustine's argument for the existence of God in *Confessions* VII, xvii, 23, and uses it to supply an independent starting-point for psychology and physics. The third Meditation is much more than this short passage from Augustine. This passage certainly gives the *core* of the argument of the third Meditation but Descartes presents the argument in a much more elaborate way, with a great concern for deductive certainty, distinguishing the different steps that have to be proved and noting and eliminating all alternate explanations for how we might have acquired our idea of God. It is natural to attribute this difference to the difference between the genres Augustine and Descartes are writing in, and perhaps the difference in mentalities these genres express. Descartes is writing a book of philosophical argument (and he wants geometers to judge it), while Augustine is writing a spiritual autobiography, describing his own experience of understanding without trying to compel anyone to follow him. But I think it is something more than this that explains what is distinctive about the third Meditation (and I also think the difference in genre is less than it appears). Because Descartes wants to present the knowledge of God, and specifically the knowledge achieved by reflecting on the idea of God as a standard of rational perfection, as the *only* foundation for science, he is forced to proceed much more slowly and carefully in order to bring out the difference between this one idea, which gives a basis for a knowledge of extramental reality, and all other ideas, which do not. Augustine had been content to say that since he must have "known the immutable" in order to prefer the immutable truth to his mutable mind, he must have gained this knowledge from contact with the immutable truth itself. Descartes believes the same; but, given the project of the *Meditations*, he cannot simply assume that our knowledge of X comes from an actual X resembling our idea. The first Meditation had been devoted to undermining just this kind of confidence. This is not just a result of the first Meditation, but also a major theme of the third. The beginning of the third Meditation cautions against basing science on the "general rule . . . that everything I perceive very clearly and distinctly is true" (AT VII, 35), since "I previously admitted as entirely certain and manifest many things which I afterwards recognized to be doubtful," namely "heaven, earth, stars, and everything else I took from the senses" (ibid.). This is why we need to examine our thoughts critically, to see where the possibility of falsehood arises. Descartes concludes that the main kind of error "consists in my judging that ideas which are in me are similar or conformable to things placed outside me" (AT VII, 37). I have believed this in the past about sensory ideas because it is what nature seems to teach and because the ideas arise in me with great force and apart from my will, as if they were the imprint of something external on me. The third Meditation examines these warrants for our judgment, and finds them insufficient. Descartes wants to show that not (what Hume will call) the "force and vivacity" of our ideas, but rather their objective content, is evidence that they are the imprint and likeness of external objects. Then he wants to show that, even among our purely intellectual ideas, it is only the idea of God that must be impressed on me by a corresponding actual being.[17] Long before Augustine, Plato had argued that my grasp of a perfect standard of equality requires my contact with actual Equals-themselves. Descartes argues that while there is an eternally possible *essence* of equality, I could have gained the conception from something that contains that reality only eminently (e.g., from God himself), and that only the idea of God gives me access to actual *existence*, and so the hope of a science of actual things. What is remarkable about the Augustinian proof of the existence of God, as Descartes presents it, is not just that it proves the existence of God, but that it fails to prove the existence of anything else. For the third Meditation to play its assigned foundational role, its ingenious explorations of failure are needed just as much as its positive results. Once we recognize the Augustinian argument at the core of the third Meditation, we can go back to the text to see how Descartes uses it to effect a transvaluation of the evidential value of our ideas, and a consequent revolution in the science of external things.

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[16] For God as the source of law in nature and simultaneously of its knowability to us, see the letter to Mersenne of 15 April 1630, cited in note 14. For Descartes' strategy of arguing from God to the universal law of the conservation of motion, see *Principles* II, 36-42 and *Descartes and Augustine*, chapter 8, section D (dissertation, chapter 3, section C. 4), and, in a broader historical context, my "Descartes and Some Predecessors on the Divine Conservation of Motion," *Synthese* v. 83 (May 1990). As I argue there, Descartes is starting from the Aristotelian and Platonist description of God (or a divine Nous or Reason) as the sole mover *in the heavens*, producing an eternally constant and therefore mathematically describable motion in the heavens. Descartes transforms this picture by arguing that God is the sole mover *anywhere*, and that he must produce an eternally constant (and thus mathematizable) motion *throughout the universe.*

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[17] Hume can be taken as an elaboration of precisely the position Descartes is trying to attack. The whole of Hume's argument in the *Enquiry concerning Human Understanding* and in Book I of the *Treatise of Human Nature* depends on the distinction between impressions and (what Hume calls in the strict sense) ideas. The distinction is founded simply on the superior *strength* of impressions. But Hume claims that our ideas must all be derivative from our impressions and that only our impressions could be directly produced in us by external things. But how does Hume know that the idea of God, though constant and calm rather than sudden and forceful, is not "impressed" on us directly by a corresponding object? Descartes, of course, does not deny that our sensory ideas are also caused in us by external things. He calls this into question in the third Meditation just as a way of challenging the thesis that our sensory ideas are caused by external things *that resemble the ideas.*

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The Philosophical Review, XCIII, No. 4 (October 1984)

DESCARTES ON THE CREATION OF THE ETERNAL TRUTHS

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In April 1630 Descartes wrote, in a state of some excitement, to the faithful Mersenne, to announce a metaphysical doctrine which caused then, and has caused ever since, much puzzlement among his readers:

> (1) The mathematical truths, which you call eternal, have been established by God and depend on him entirely, just as all other creatures do . . . he has established these laws in nature as a king establishes laws in his kingdom.[1]

Subsequently Descartes explains that the eternal truths—what *we* would call necessary truths—depend on God's will, that since God's will was free, he could have created a world in which these truths did not hold, just as he could have not created any world at all.[2] So, for example, God was free to create a world in which the lines from the center of a circle to its circumference were not all equal. We cannot comprehend this possibility, but that is because our intellects are finite, whereas God's power is infinite and incomprehensible.

Clearly this is a bizarre doctrine. But *how* bizarre is it? What exactly is Descartes committed to by this doctrine? Why does he hold it? What is the best that can be said in defense of it? Those are the questions I hope to answer in this paper. But before I proceed to say what I think Descartes *is* committed to by this doctrine, let me say what I think he *is not* committed to.

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[1] Letter of 15 April 1630, in Descartes, *Oeuvres philosophiques,* Vol. I, edited by F. Alquié, (Paris: Garnier, 1963–1973), pp. 259–260. Cited hereafter as Alquié.

[2] Letter to Mersenne, 27 May 1630, Alquié I, 268.

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I

There is an interpretation of Descartes, often found in the literature, and interestingly developed recently by Harry Frankfurt,[3] according to which Descartes's doctrine commits him to the thesis that there are no necessary truths, no truths whose negation is impossible, that, from a logical point of view, anything is possible. This thesis might be expressed in the symbolism of modal logic by $(p)Mp$, that is, for any p, p is logically possible. Frankfurt puts it by saying that the eternal truths are "*inherently* as contingent as" or "no more *ultimately* necessary than" any other propositions (p. 42). I take it that the force of the qualifying expressions which I have emphasized is to allow that, although *we*, of course, *perceive* the eternal truths as necessary, that is just a fact about us, it does not show anything about the intrinsic nature of what we perceive:

> (2) The propositions we find to be necessary . . . need not be truths at all. The inconceivability of their falsity . . . is not inherent in them. It is properly to be understood only as relative to the character of our minds (Frankfurt, "Creation," p. 45).

The inability of our minds to conceive of the falsity of the eternal truths is "merely a contingent characteristic of our minds" (p. 44). God might easily have created us otherwise. And if he had created us otherwise, he would not have deceived us in any absolute sense, because there's nothing in contradictions themselves which makes them impossible.

Descartes, of course, never says this in so many words. Otherwise Frankfurt's interpretation would not be an interpretation, but merely a restatement of the doctrine. So what *did* Descartes say that has led interpreters to ascribe this doctrine to him?

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[3] "Descartes on the Creation of the Eternal Truths," *The Philosophical Review* Vol. 86, no. 1, (1977), pp. 36–57. Cited hereafter as Frankfurt, "Creation." Cf. Cronin, T., *Objective Being in Descartes and Suarez,* (Rome: Gregorian University Press, 1966), p. 37; Wells, N.J., "Descartes and the Scholastics Briefly Revisited," *New Scholasticism* 35 (1961), p. 182. I had originally been inclined to read J.-L. Marion's *Sur la théologie blanche de Descartes* (Paris: PUF, 1981) as operating under the same assumption, but M. Marion tells me, in conversation about a draft of this paper, that he agrees with me against Frankfurt on this point.

First, in some passages in which Descartes expounds his creation doctrine he does abstain from saying, in his own person, that the eternal truths are really eternal. So in the letter to Mersenne quoted above (1), he speaks of "the truths of mathematics, which *you* call eternal . . . "[4] Someone might well take that to imply that Descartes himself thinks that the truths of mathematics are not really eternal or necessary.[5]

More serious are passages like the following, which comes from a letter to Mesland (2 May 1644):

> (3) As for the difficulty of conceiving how it was a matter of freedom and indifference for God to make it not be true that the three angles of a triangle were equal to two right angles, or generally, that contradictories cannot exist together, one can easily remove it by considering that the power of the God cannot have any limits . . . (Alquié III, 74).

What is particularly striking about this passage is that Descartes allows that the denials of mathematical truths do involve a contradiction and yet maintains that their contradictoriness is only a reason for regarding them as false, not for regarding them as impossible. Take any contradiction you like. God could have made it true. Hence, it could have been true. Hence, it is possible, even if false. Hence, anything is possible, there are no necessary truths.

II

Whatever we may think of the intrinsic merits of the doctrine that there are no necessary truths, we should recognize that there are compelling systematic reasons why Descartes should not hold it. The most obvious, of course, is that Descartes thinks God has the property of existing necessarily (Alquié II, 593). Surely this entails that there is at least one necessary truth, viz., that God exists. But some interpreters (though not Frankfurt) exempt eternal truths about God from the scope of the creation doctrine. So let us pass to other examples.

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[4] Alquié I, 259. There is a similar passage in a letter to Mersenne of 17 May 1638, Alquié II, 62.

[5] As Gueroult did in his *Spinoza*, vol. I (Paris: Aubier-Montaigne), p. 80, n. 238. Marion (op. cit., pp. 161–178) also emphasizes this language, but apparently does not draw Gueroult's conclusion.

Consider the ontological argument. As Descartes expounds this, it requires the assumption that I conceive of countless things which have true, immutable and eternal natures, even though they may never have existed or have been thought of (AT VII, 64). These eternal natures do not depend on my mind; my thought does not impose any necessity on things, rather the necessity of the things themselves determines me to think of them in the way that I do.[6] This hardly sounds like a man who would write, as Frankfurt does on his behalf, "the necessities human reason discovers . . . are just necessities of its own contingent nature" ("Creation," p. 45).

Moreover, not only do we perceive that the truths of mathematics are necessary, sometimes, at least, we perceive clearly and distinctly that they are necessary (e.g., at AT VII, 65). If they aren't in fact necessary, then it looks as though Descartes will have to give up his criterion of truth. Not everything we perceive clearly and distinctly is true. At the time of writing his article on the creation of the eternal truths, Frankfurt replied to an objection of this kind that it presupposed a realist conception of truth which he had independent grounds for denying to Descartes. At that stage he evidently still thought that the most satisfactory solution to the problem of the Cartesian circle required us to ascribe a coherence theory of truth to Descartes ("Creation," p. 52). Subsequently, however, Frankfurt has apparently recanted, acknowledging that "whenever Descartes gives an explicit account of truth he explains it unequivocally as correspondence with reality."[7] So invoking a coherence theory of truth will not give us a plausible way out of the difficulty that we clearly and distinctly perceive certain truths to be necessary.

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[6] AT VII, 67. In a paper read at the APA meetings in Boston, December 1980, "Descartes on God's Ability to Do the Logically Impossible," Richard La Croix emphasized an analogous passage in the Sixth Replies (AT VII, 436).

[7] "Descartes on the Consistency of Reason," in *Descartes: Critical and Interpretive Essays*, edited by M. Hooker (Baltimore: Johns Hopkins University Press, 1978), p. 37. He cites no texts, but presumably has in mind passages like that in the letter to Mersenne of 16 October 1639 (Alquié II, 144). See also the discussion in my *Descartes Against the Skeptics*, (Cambridge, Mass.: Harvard University Press, 1978), pp. 108–112.

DESCARTES ON THE CREATION OF THE ETERNAL TRUTHS

Perhaps the most interesting systematic reason for hesitating to ascribe to Descartes the thesis that there are no necessary truths is that the recognition of necessary truths seems to be central to his philosophy of science. In *Le monde* Descartes classes the fundamental laws of physics together with the principles of mathematics as necessary or eternal truths:

> (4) In addition to the three laws I have explained, I do not wish to suppose any others, except those which follow infallibly from those eternal truths on which the mathematicians are accustomed to base their most certain and evident demonstrations, those truths, I say, according to which God himself has taught us that he has disposed all things in number, weight and measure, and whose knowledge is so natural to our souls that we cannot but judge them to be infallible when we conceive them distinctly, nor doubt that if God had created several worlds, they would be as true in all of them as they are in this one (AT XI, 47).

Here Descartes assimilates principles of physics—principles of inertia and of the conservation of motion—to mathematical truths. To that extent he may remind us of Quine. But in Descartes's case the assimilation is made in order to claim necessity for *both* mathematical and physical laws.

Even more interesting, perhaps, is the fact that Descartes here anticipates an idea usually credited to Leibniz, that necessary truths are those which are true in all possible worlds. The same idea is emphasized again in the *Discourse on Method,* when Descartes summarizes what he had done in *Le monde:*

> (5) I showed what were the laws of nature, and without basing my arguments on any other principle than the infinite perfections of God, I tried to demonstrate all those of which one could have any doubt and to show that, even if God had created several worlds, there could not be any in which they would fail to be observed (AT VI, 43).

It's important for the methodology of Cartesian physics that the laws of nature should be true in all possible worlds; only if they are, can physics be *a priori* to the extent that Descartes thinks it is. Not that Descartes thinks physics is wholly an *a priori* science. He does recognize a role for experiment there, as many recent studies have emphasized.[8] The function of experiment, however, is not to determine what the laws of nature are, but to determine *how,* given those laws of nature, the effects are produced, to determine the initial conditions, typically unobservable mechanisms, from which the phenomena can be deduced.[9] If Descartes thought there were no necessary truths, it would be difficult to see why he should not extend his empiricism even to the laws of nature.[10]

III

We have, then, at least three systematic reasons why it would be awkward for Descartes to affirm, what the standard interpretation of his creation doctrine requires, that there are no necessary truths. The standard interpretation is hard to reconcile with (i) Descartes's commitment to true and immutable natures in the ontological argument, (ii) his acknowledgment that we clearly and distinctly perceive certain truths to be necessary, and (iii) his (limited) use of an *a*

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[8] See, for example, Daniel Garber's "Science and Certainty in Descartes," in Hooker, op. cit.; and the literature cited there.

[9] The whole issue is undoubtedly more complicated than I suggest here, but two passages which support this reading would be in the *Discourse,* vi (AT VI, 64–65) and *Principles* IV, 199–206. Alquié's annotation of the former passage is particularly relevant to our present theme. Descartes writes: "First I tried to find in general the principles, or first causes of everything that is, or *that can be,* in the world . . ." (my emphasis). Alquié (I, 636, n. 1) observes that this formula "indicates sufficiently that the *a priori* deduction which will be carried out on the basis of principles will result in the reconstruction of a possible world rather than in the explanatory description of the real world. Nevertheless, it will suffice so long as it is a matter of generalities (heavens, stars, etc.). It will no longer suffice when one wishes to descend to *more particular* things, that is, to explain why this possible body, rather than some other, exists." I would prefer to say that the deduction shows what *any* possible world is like. That is why it suffices.

[10] I agree with Kripke that we ought to keep the logico-metaphysical issue of necessity or contingency separate from the epistemological issue of *a prioricity* or *a posterioricity.* There may be contingent *a priori* truths and necessary *a posteriori* truths. Cf. *Naming and Necessity,* (Cambridge, Mass.: Harvard University Press, 1980 passim). All my argument requires, I think, is that it should be natural to assume that only the necessary is knowable *a priori.* So there is some plausibility in the historical thesis that the empiricism of modern natural science had its origin in the Judaeo-Christian conception of nature as the product of divine will. Cf. the essays of O'Connor, Foster and Oakley in Part I of *Creation: The Impact of an Idea,* edited by D. O'Connor and F. Oakley, (New York: Scribners, 1969).

priori method in physics. In the next section I shall argue that there are textual grounds for questioning the standard interpretation even in those passages in which Descartes is expounding his creation doctrine. But before we come to those passages, let me amplify a remark made above in passing.

Descartes, I maintain, anticipated an idea usually credited to Leibniz, that necessary truths are those which are true in all possible worlds. You might object that in the passages cited in support of that claim Descartes does not explicitly use the notion of a *possible* world, the notion he uses is that of a world God might have created. He identifies necessary truths with those which would have been true in any world God created.

And that's certainly true. Nevertheless, the grounds for crediting Descartes with this idea are as good as those for crediting Leibniz with it. The same question has been raised about Leibniz. So far as I have been able to discover, there is no passage in which Leibniz explicitly identifies necessary truths with those true in all possible worlds. The best support for attributing that view to him[11] comes from the following passage:

> (6) Essential [propositions] are those which can be demonstrated by a resolution of the terms, which are necessary, or virtually identical, so that their opposite is impossible or virtually contradictory. These have eternal truth. Not only will they obtain so long as the world lasts, they would also have obtained if God had created the World in another way.[12]

In one respect, Descartes is closer to most modern conceptions[13] in that he speaks of other worlds, rather than other ways of creating the World. In another, he is more remote, in that he conceives of his alternative worlds as ones which do not exclude one another

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[11] Cited by Benson Mates, in "Leibniz on Possible Worlds," in Frankfurt's *Leibniz, a collection of critical essays,* (Garden City, N.Y.: Anchor, 1972), p. 337. The attribution to Leibniz of the idea that necessary truth is truth in all possible worlds is questioned by William Lycan in "The Trouble with Possible Worlds," in *The Possible and the Actual,* ed. by M. Loux, (Ithaca, N.Y.: Cornell University Press, 1979), p. 274, n. 1.

[12] *Opuscules et fragments inédits de Leibniz,* edited by L. Couturat (Paris: Alcan, 1903), p. 18.

[13] The qualification is necessitated by Kripke's cautions about the term 'possible world' in *Naming and Necessity,* p. 48n, pp. 15 ff.

("If God had created *several* worlds . . . "—my emphasis). But both in Descartes and in Leibniz the connection between necessary truth and truth in all possible worlds is expressed in terms of divine creation, of a world God might have created, or a way God might have created the world.

IV

Apart from the systematic difficulties the standard interpretation of the creation doctrine involves, there are suggestions of a different interpretation, one which acknowledges the existence of necessary truths, even in those passages in which Descartes is expounding or defending the doctrine. Consider that first puzzling letter to Mersenne. In it Descartes endeavors to prepare Mersenne for dealing with objections by constructing the following imaginary dialogue:

> (7) They will tell you that, if God had established these truths, he could change them, as a king does his laws; to which one must reply yes, if his will can change.—But I understand them as eternal and immutable.—And I judge the same concerning God.—But his will is free.—Yes, but his power is incomprehensible (Alquié I, 260–261).

The point here is to reassure the imaginary opponent that the truths in question are genuinely necessary, in spite of having been created by a free act of God's will. As Beyssade explains,

> (8) The incomprehensibility of the divine power, far from extending contingency to the domain of mathematical truths, where we perceive only necessity, is invoked, on the contrary, to safeguard necessity, where we can only imagine contingency. It is true that our imagination can only represent the work of a free will as contingent. . . . But the Cartesian reminds us that our inability to imagine a will which is free, and nevertheless immutable, and creative of truths truly necessary, does not prove [that there can be no such thing].[14]

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[14] *La philosophie première de Descartes,* by J.-M. Beyssade (Paris: Flammarion, 1979), p. 112. Cited without any appearance of disapproval by Marion, op. cit., p. 278n.

And Descartes's imaginary dialogue in the first letter to Mersenne is not the only such passage.

Consider the not-so-imaginary opponent Gassendi, who objected, against the ontological argument, that it seemed hard to maintain that there is an eternal and immutable nature other than God. Descartes's reply does not deny that the true and immutable natures are really eternal. "You would be right," he says, that is, it would be a hard thing to maintain that there are true and immutable natures.

> (9) If it were a question of an existing thing, or even if I had established something so immutable that its very immutability does not depend on God. But just as the poets feign that the destinies have indeed been established by Jupiter, but that after they have been established, he is himself bound to observe them, so I don't think that in truth the essences of things and those mathematical truths which can be known concerning them, are independent of God; rather I think that, because God so willed it, because he disposed them so, they are immutable and eternal. Whether that seems hard or soft to you matters little. It is enough for me that it is true (AT VII, 380; Alquié II, 827).[15]

The eternal truths are truly eternal, even though they have been created.

If we suppose that this is Descartes's position, we trade one paradox for another. The standard interpretation requires us to ascribe to Descartes the paradox that there are no necessary truths. The alternative I am pursuing is that there are necessary truths, but that some or all of them are created. Out of the frying pan into the fire, you may say. And in the end, perhaps, I agree. But apart from the historical interest we may have in determining just what mistake Descartes made, I think there is some philosophical interest in seeing just what there is about this doctrine that makes it a mistake.

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[15] One disquieting note about this passage. Here Descartes accepts the comparison between God's relation to the eternal truths and Jupiter's relation to the destinies, whereas in the letter to Mersenne of 15 April 1630 (Alquié I, 259–260) he rejected that comparison as demeaning to God. The solution to that puzzle seems to be that in the letter to Mersenne he did not think of the destinies as being in any way dependent on Jupiter, whereas in the 5th Replies he does.

A natural objection is this. Creation, if it is anything, is an act, hence an event, hence something essentially related to time. For any event, it must make sense to ask "At what time did that event occur?" It may be difficult to answer that question, but it must always make sense to ask it. The eternal truths, on the other hand, are essentially not related to time. For any eternal truth, it does not make sense to ask "At what time did that eternal truth come into existence or come to be true?" If it's really eternal, the question is improper; there can be no time at which it came to be true.

It's clear, I think, what Descartes will say to this. He will reject the assumption that if the eternal truths were created, there must be a time at which they were created. He does use temporal language in various places in connection with his creation doctrine. In the passage quoted above (9), he is willing to compare God to Jupiter, who was bound to observe his decrees *after* he had made them. And in the *Conversation with Burman,* when Burman asks:

> (10) Does it follow from this [the doctrine of the creation of the eternal truths] that God could have commanded a creature to hate him, and thereby made this a good thing to do?[16]

Descartes replies:

> (11) God could not *now* do this: but we simply do not know what he could have done. In any case, why should he not have been able to give this command to one of his creatures? (my emphasis).

These are only the most striking instances of Descartes's use of temporal language in expounding his doctrine of the creation of the eternal truths. It's quite characteristic for him to talk about what God *could have* done, rather than what God *can* do, as if there was a time at which God hadn't yet established the eternal truths.

Still, Descartes can't mean this temporal language to be taken at face value. For whereas he apparently does think of the creation of the world as a datable event, occurring approximately 5000 years ago,[17] he evidently does not so conceive the creation of the eternal truths. What God did, to create the eternal truths, was to will and understand them from all eternity.[18] There is no time at which they came to be, no time prior to which they were not true. This is at least one difference between God's actions and men's. Another is that the act by which God understands, wills and brings about all things occurs at all times as one "perfectly simple" act.[19] So the concept of an action, when applied to God, does not have the same implications it does when applied to man.

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[16] *Descartes's Conversation with Burman,* translated by John Cottingham (Oxford: Clarendon Press, 1976), p. 22.

Whether this doctrine is consistent or not, I make no attempt to decide. There would seem to be a problem in reconciling the following three propositions:

(i) God created the world in time.

(ii) God created the eternal truths from eternity.

(iii) God created all things by one perfectly simple act.

But perhaps I do not adequately understand the divine simplicity. Perhaps no finite mind is supposed to understand it. In any case, rather than focus on the disanalogies between God's actions and men's, I prefer to exploit an analogy between them.

I take my cue from Beyssade (8), who observes that Descartes's doctrine is invoked "to safeguard necessity where we can only imagine contingency," that is, in the domain of the will. One way of expressing the connection between volition and contingency is to say that it is, in general, true of any agent, *a*, that if *a* wills that *p*, then it is at least logically possible that *a* not will that *p*.[20] Using a symbolism which I hope will be perspicuous,[21] we might express this as follows:

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[17] To Burman's objection that eternity is all at once and once for all, Descartes replies: "That is impossible to conceive of. It is all at once and once for all, insofar as nothing is ever added to or taken away from the nature of God. But it is not all at once or once for all in the sense that it exists all at once. For since we can divide it up now, after the creation of the world, why should it not have been possible to do the same before creation, since duration remains constant? Thus eternity has now co-existed with created things for, say, 5000 years, and has occupied time along with them; so it could have done just the same before creation if we had had some standard to measure by" (op. cit., pp. 6–7; cf. the Sixth Replies, AT VII, 432).

[18] Letter of 27 May 1630 (Alquié I, 268) and cf. the *Conversation with Burman*, pp. 15–16.

[19] Cf. *Principles* I, 23, and the comment on it in the *Conversation with Burman*, pp. 31–32.

(i) $(a)(p)(Wap \rightarrow M\overline{Wap})$

(i) seems to express a general logical truth about acts of will. If we express God's omnipotence by saying that a proposition is true if and only if God wills it to be true,

(ii) $(p)\ (p \leftrightarrow Wgp)$

then it seems possible to derive from these assumptions a thesis involving iterated modalities which might plausibly be taken to express Descartes's creation thesis in atemporal language. Let p_1, be any necessary truth, so that

(iii) Lp_1

In virtue of (ii), we have

(iv) $Lp_1 \rightarrow \bar{W}\bar{g}\bar{L}\bar{p}_1$

In virtue of (i), we have

(v) $WgLp_1 \rightarrow M\overline{WgLp_1}$

Detaching the consequents of (iv) and (v), we get

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[20] I am much indebted in this paragraph to Wayne Wasserman, whose comments on an earlier version of this paper prompted me to simplify the argument at this point. The crucial principle (i) is invoked by James Ross in *Philosophical Theology* second edition, (Indianapolis: Hackett, 1980), p. xx.

[21] I use 'a' as an individual variable, 'p' as a propositional variable, 'W . . . ' as a two-place predicate to be read ' . . . wills that __', 'M' and 'L' to symbolize logical possibility and necessity, respectively, and '→' to represent entailment.

(vi) $M\overline{WgLp}_1$

that is, it's possible that God doesn't will p_1 to be necessary. But since p_1 is necessary only if God wills it to be necessary (by (iv)), (vi) entails

(vii) $M\overline{Lp}_1$

Since p_1 was a randomly selected necessary truth, the deduction from (iii) to (vii) allows us to generalize to

(viii) $(p)\ (Lp \rightarrow M\overline{Lp})$

(The principle invoked here is that $p \rightarrow q$, then $M\bar{q} \rightarrow M\bar{p}$.)

or equivalently,

(ix) $(p)\ (MMp)$

So the suggestion is that we should understand Descartes's doctrine of the creation of the eternal truths as involving, not a denial that there are necessary truths, but a denial that those which are necessary are necessarily necessary. To think of these truths as created is neither to think that they are not necessary, nor to think that there was a time when they were not necessary, but to think that it is not necessary that they be necessary. Iterated modalities in the timeless present express Descartes's thought better than his own temporal language does.[22]

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[22] As we shall see later, I think that *(p)MMp* is *not the best* formula for expressing Descartes's creation doctrine. I adopt it here only provisionally, to avoid for the time being the explanations a more exact formula will require. Lee Horwitz has pointed out a difficulty with the argument of this paragraph. Descartes holds that creation is continuous and that the distinction between creation and conservation is only a distinction of reason (AT VII, 49). If I continue to exist from one time to another, I do so because God, by one and the same action, wills my continued existence. In the case of the eternal truths, God's continuous volition of their truth is supposed to be an immutable act. God's immutability is what explains the necessity of these truths. But if God's continuous volition of these truths is immutable, then, once he has willed them, he cannot not will them, in violation of (i). I

This suggestion about how to interpret Descartes's creation doctrine was first made, I think, by Geach.[23] Geach does not support the suggestion textually, but it's worth noting that there is a quite explicit textual basis for supposing Descartes to have been making a claim about iterated modalities. A passage that we considered earlier (3), from Descartes's letter to Mesland of 2 May 1644, continues:

> (12) Then also by considering that our mind is finite and created of such a nature that it can conceive as possible the things that God has willed to be truly possible, but not of such a nature that it can also conceive as possible those which God could have made possible, but nevertheless willed to make impossible. [That God's power has no limits] tells us that God cannot have been determined to bring it about that it was true that contraries cannot exist together and that, hence, he could have done the contrary . . . though God has willed that certain truths were necessary, that is not to say that he has willed them necessarily. For to will that they were necessary and to will them necessarily, or to be necessitated to will them, are completely different (Alquié III, 74).

Here we have Descartes invoking a scope distinction between

(1) WgLp

and

(2) LWgp

in a way that has a clear bearing on a scholastic argument we shall shortly consider (see pp. 585–588). It should be evident that in this passage Descartes wants to allow that there are some propositions which are in fact impossible, but which might have been possible,

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take this to be a difficulty in Descartes's philosophy, rather than in my interpretation of it, a difficulty perhaps first seen by Spinoza (cf. the *Ethics* I P33S2).

[23] In an article entitled "Omnipotence," first published in *Philosophy* 48 (1973), pp. 7–20, and subsequently reprinted in *Providence and Evil* (Cambridge, Eng.: Cambridge University Press, 1977). Geach's suggestion is discussed by Alvin Plantinga in *Does God Have a Nature?* (Milwaukee: Marquette University Press, 1980), pp. 103–114, but rejected as "contrary to the fundamental thrust" of Descartes's system.

and that others are in fact necessary, but might, nevertheless, not have been necessary. There is nothing epistemic about these "mights." We are not saying: "These things *seem* necessary, but, for all we know, they might not *be* necessary." We are saying: "These things *are* necessary, but there is nothing necessary about *that.*"

V

Why did Descartes hold this doctrine? Clearly he thought that God's omnipotence required it. But this simple, obvious answer does not take us very far. *Why* should he have thought that God's omnipotence required God to be the creator of eternal truths? Descartes writes as if his doctrine were the only alternative to postulating something eternal that is independent of God:

> (13) As for the eternal truths, I say again that *they are true or possible because God knows them to be true or possible, but not that they are known by God to be true as if they were true independently of Him.* . . . One must not say, then, that *if God did not exist, nevertheless those truths would still be true,* for the existence of God is the first and most eternal of all the truths which can be, and the only one from which all the others proceed. But what makes it easy to be mistaken in this is that most men do not consider God as an infinite and incomprehensible being, who is the only author on whom all things depend.[24]

But why should Descartes suppose that if God does not create the eternal truths, they are true independently of Him? The Thomistic view, after all, conceived the eternal truths as neither created nor independent of God:

> (14) If no intellect were eternal, no truth would be eternal. But because the divine intellect is eternal, truth has eternity in it alone. Nor does it follow from this that anything other than God is eternal; because truth in the divine intellect is God himself (*Summa Theologiae* Ia 16, 7).

Why does Descartes reject this Thomistic solution?

Frankfurt addresses this problem and suggests that Descartes thought the Thomistic doctrine compromised God's simplicity. It made the eternal truths depend on God, all right, but on God's intellect, not on his will. To say this is to imply a distinction between God's intellect and his will. And certainly Descartes does think it essential to identify God's intellect and will, and does connect this identification with his creation doctrine. In the passage quoted above (13), I omitted the following sentence:

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[24] To Mersenne, 6 May 1630, Alquié I, 264–265. Italicized phrases are in Latin in the original, whereas the rest of the letter is in French.

> (15) If men understood properly the meaning of their words, they could never say without blasphemy that the truth of a thing precedes the knowledge God has of it, for in God willing and knowing are one, in such a way that *from the very fact that he wills something, he thereby knows it, and on that account only such a thing is true.*[25]

But it should be noted that here the identity of God's will and intellect is invoked against an opponent who maintains that the truth of a thing precedes God's knowledge of it. This can hardly be Thomas.

One difficulty with Frankfurt's account is that it speaks not of Thomism, but of Scholasticism, and treats "Scholastic philosophers such as Suarez and Aquinas" ("Creation," p. 39) as if there were no important differences between them. But there are. If we examine Suarez's criticism of the Thomists, we will find that it is Suarez who best fits the profile of Descartes's opponent.[26] Descartes neglects

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[25] Alquié I, 264. Again, the italicized phrases are in Latin in the original. Frankfurt cites a passage from the Sixth Replies (AT VII, 431–432), but that passage is less satisfactory for his purposes than (15), since it appears to make God's intellect subordinate to his will. Cf. Alquié's annotation, Alquié II, 872, n. 2, and Marion, 282–289.

[26] In what follows I am much indebted to Cronin, op. cit. The interpretation of Suarez is a delicate business and Cronin's reading may not be correct. In "Suarez on the Eternal Truths," *The Modern Schoolman* 58 (1981), pp. 73–104, 159–174, Norman Wells emphasizes the difference between Suarez's various Thomistic opponents and the danger of taking some of Suarez's statements as representative of his own final position. For the purpose of identifying a likely opponent for Descartes, however, I believe it will be sufficient if Cronin's interpretation represents a natural misreading of Suarez. No doubt the historical situation is far more complex than either Cronin or I represent it as being. The best available account is now, no doubt, the massive and erudite, but very difficult work of Marion cited in fn. 3.

Thomas's alternative theory, I suggest, because he tacitly accepts the validity of Suarez's criticism of Thomas.

In the *Metaphysical Disputations*,[27] one of the problems Suarez takes up is what we might call the problem of the existential import of necessary truths. Suarez takes it for granted that there can be eternal (necessary) truths—for example, "All men are animals"—about beings whose existence is contingent. But the orthodox doctrine in medieval quantification theory was that universal generalizations entail the existence of members of their subject class. On the other hand, it is orthodox doctrine in anybody's modal logic that a truth entailed by a necessary truth is itself necessary. How can "All men are animals" be necessary while "There are men" is contingent?

This is not Suarez's way of setting up the problem. His way of putting it is as follows: if the essence of a thing perishes when the thing ceases to exist, then those propositions in which essential predicates are predicated of a thing are neither necessary nor of perpetual truth. This conclusion is unacceptable, since it would entail that all truths about creatures would be contingent, and hence, since all science is of necessary truths, that there could be no science concerning creatures. Suarez notes that "some modern theologians" have been willing to grant that propositions putatively of perpetual truth might come, and cease, to be true as things come, and cease, to exist, but finds the opinion contrary to the wisdom of the philosophers and of the Church fathers.

Suarez then considers and rejects a Thomistic solution: that eternal truths about creatures might be true, regardless of the existence of the creatures, "not in themselves, but in the divine intellect." This, he says, won't do. For contingent truths have a perpetual truth in the divine intellect as much as necessary ones do. And—what is more important for our purposes—the eternal truths. . .

> (16) . . . are not true because they are known by God, rather they are known because they are true, otherwise no reason could be given

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[27] *Disputationes metaphysicae*, 2 vols. (Hildesheim: Georg Olms, 1965). The passages I shall be concerned with are in Disputation XXXI, Section xii, 38–47, pp. 294–298.

> why God necessarily knows that they are true, for if their truth proceeded from God himself, that would happen by means of God's will, so it would not proceed necessarily but voluntarily . . . (p. 295)

Part of the interest of this for the Cartesian scholar is that it provides us with an identifiable individual who (apparently) asserts what Descartes denied in the letter to Mersenne quoted above (13). But so far there is nothing in Suarez which says that the eternal truths are true independently of God. As the passage continues, however, it certainly implies this. For example, in relation to these truths, the divine intellect is

> (17) . . . speculative, not operative; but the speculative intellect supposes, and does not make, the truth of its object; so propositions of this kind . . . have perpetual truth not only as they are in the divine intellect, but also according to themselves and prescinding from the divine intellect (*Ibid.*).

Suarez's own theory (§§ 44, 47) is that propositions like "Man is an animal" can be construed in two different ways: (i) the copula linking the terms may signify an actual and real conjunction of the terms existing in the thing itself, in which case the truth of the proposition depends on "the efficient cause on which the existence of the terms depends"; if the terms don't 'exist' (i.e., aren't instantiated), the proposition will be false; (ii) alternatively, the copula may signify only that the predicate is 'of the nature of the subject', whether the terms exist or not; in this sense, the proposition is equivalent to a strict conditional, "if something is a man, it is an animal" (= "it cannot be the case that man comes into existence unless an animal does"); but the truth of this conditional does not depend on the instantiation of its terms, or as Suarez says, on the existence of an efficient cause which could produce instances of the terms:

> (18) If, per impossibile, there were no such cause, that proposition ["every animal has a capacity for sensation"] would nevertheless be true (*Ibid.*, p. 297).

In adopting this solution, Suarez is, in effect, restricting the orthodox medieval doctrine of existential import. But he is also, apparently, committing himself to the proposition Descartes is so anxious to deny: *that the eternal truths would be true even if God did not exist* (cf. (13) above).

Of course, the fact that Suarez says what Descartes denies does not show that Descartes had Suarez in mind as an opponent. But Suarez's work was in common use in Jesuit schools like the one at which Descartes was educated (Cronin, op. cit., pp. 32–33). In spite of his ritual protestations of ignorance of the work of his predecessors, Descartes can cite Suarez when it serves his purpose (Alquié II, 677). I think it's reasonable to suppose that Descartes might well have cited Suarez (but not Thomas) in this context, had he been pressed to identify a philosopher who held the kind of doctrine against which his own creation theory was aimed.

But why does Descartes neglect the Thomistic alternative? Earlier I suggested that Descartes may have taken for granted Suarez's critique of St. Thomas. Let me try to make that more explicit. Suarez thinks we must explain why there is a necessary connection between nonexistent terms, explain what is the foundation of those necessary conditionals whose terms are not instantiated. He thinks it will not be sufficient to say that the connection exists in God's idea of the species and that the necessity arises from that exemplar, because one of the things we want to know is why the divine exemplar represents the connection as a necessary one. His own answer seems to be that the necessity proceeds "from the object itself," and not from the exemplar, though he admits that there is some difficulty in seeing how this can be, since in itself that object is nothing. I suppose that Descartes *may have* felt (as I believe Suarez *did* feel) that, since truth involves a correspondence between thought and reality, Suarez was raising a genuine difficulty for St. Thomas. If truth is correspondence, and if there really are necessary truths, there must somehow be necessities *in re.*

Since Suarez's alternative position did *seem,* at least, to posit something eternal other than God, it is understandable that Descartes would resist that. But he may have felt that the dialectic left him a third alternative. Suarez had reasoned as follows: (a) if the eternal truths were true because they were known by God, we would not be able to give any reason why God would necessarily know them to be true; (b) if their truth proceeded from God himself, that would be by his will, and so they would proceed voluntarily, not necessarily; hence, (c) the eternal truths must be known by God because they are true independently of his knowledge to them. I suggest that Descartes had this argument in mind and rejected step (b). To say that the eternal truths proceed from the will of God does not entail that they are not necessary. God can will that these truths hold necessarily without being necessitated to will that (cf. (12) above). So his creation of them is a genuine act of will (not necessitated), and yet it does provide a foundation of their necessity, because his will is immutable (cf. (7) above).

If we see Descartes's theory as arising out of reflection on the controversy between Suarez and Thomas, then we can understand why Descartes sometimes identifies eternal truths with those which give us no knowledge of anything that exists[28] and why he is so attracted to the comparison he makes between God's relation to the eternal truths and a king's relation to the laws of his kingdom (e.g., in (1) above). It is not merely that the eternal truths and the laws are both the products of will, but also that, because their validity depends only on their being willed by a person of sufficient authority, their validity is independent of their instantiation. Just as the king's prohibition on poaching does not, to be law, require the existence of poachers, so God's decree that all men must be animals does not, to be a truth, require the existence of men.[29]

VI

What is the best that can be said in favor of Descartes's doctrine? Much depends on interpretation. If you accept the standard interpretation, according to which Descartes holds that there are no necessary truths, then perhaps the best line to follow is that adopted by Margaret Wilson, who sees Descartes as anticipating the insight that all truths, even those of logic, are in principle revisable, and hence that none are ineluctably necessary.[30] Wilson acknowledges, of course, that there are anti-Cartesian, as well as Cartesian, elements in the position of philosophers like Quine and Putnam (p. 235, n. 31), but I don't believe that she gives sufficient weight to the anti-Cartesian elements. Not only does Descartes not "link his position to any observation of 'conceptual revolutions'," he also seems to think that *his* conceptual revolution will be the last one. That, I'd say, is one more reason for hesitating to interpret Descartes as denying that any truths are really necessary.

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[28] Cf. *The Principles of Philosophy* I, 10 and 48, and the comment on the latter passage in the *Conversation with Burman,* p. 34. See also Curley, *Descartes Against the Skeptics* (Cambridge, Mass.: Harvard University Press, 1978), p. 34.

[29] Cf. the Sixth Replies, where Descartes writes that God can be called an efficient cause of the eternal truths, "in the same way that the King is the efficient cause of the law, even if the law is not a physically existing thing, but only, as they say, a moral being."

There is textual support for the standard interpretation. Otherwise, it wouldn't have come to be the standard interpretation. But I hope enough has been said to persuade the dispassionate reader that Descartes had good reasons for not saying what he sometimes seems to be saying. I suspect he was somewhat confused about the modal status he wanted to accord to the truths *he* called eternal. The distinction between $(p)Mp$ and $(p)MMp$ is subtle enough that we can raise this suspicion without impugning Descartes's philosophical ability. In any case, the question which interests me is this: what's the best that can be said in favor of Descartes's doctrine if he is, in fact, committed to a modal thesis involving iterated modalities, and not to $(p)Mp$. For now I shall continue to use, provisionally, $(p)MMp$ to formulate the thesis involving iterated modalities. In the next section I shall consider a more accurate formula.

At one stage, I thought the following. There are, after all, systems of logic which express the modal intuitions Descartes seems, at times, to have, that is, systems of modal logic in which $(p)MMp$ is logically true. These systems, the Lewis systems S6–S8, are consistent, they have semantic interpretations, they have decision procedures. They may be incorrect systems of modal logic in that they don't state true principles of logical necessity and possibility, but at least they're coherent, and that's something. Many people have found Descartes's creation doctrine incoherent.

But this is the kind of defense Geach anticipated when he introduced the iterated modality interpretation into the literature. The passage is too delightful not to be quoted fully:

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[30] In her recent book, *Descartes* (London: Routledge & Kegan Paul, 1978), pp. 125–126.

> (19) In recent years, unsound philosophies have been defended by what I may call shyster logicians: some of the more dubious recent developments of modal logic could certainly be used to defend Descartes. A system in which 'possibly p' were a theorem, in which everything is possible, has indeed never been taken seriously; but modal logicians have taken seriously systems in which 'possibly possibly p', or again 'it is not necessary that necessarily p', would be a theorem for arbitrary interpretation of 'p'. What is more, some modern modal logicians notoriously take possible worlds very seriously indeed; some of them even go to the length of saying that what you and I vulgarly call the actual world is simply the world we happen to live in. People who take *both* things seriously, both the axiom 'possibly possibly p' and the ontology of possible worlds, would say: You mention any impossibility, and there's a possible world in which that isn't impossible but possible. And this is even further away out than Descartes would wish to go; for he would certainly not wish to say that 'It is possible that God should not exist' is even possibly true. So *a fortiori* a shyster logician could fadge up a case for Descartes. But to my mind all that this shows is that modal logic is currently a rather disreputable discipline; not that I think modal notions are inadmissible—on the contrary, I think they are indispensable—but that current professional standards in the discipline are low and technical ingenuity is mistaken for rigour.[31]

Now I am not a logician. *A fortiori,* I am not a shyster logician. But the defense of Descartes which I proposed just now does seem to me a fair target for Geach's sarcasm. One might not want to accept everything Geach says (e.g., the apparently blanket condemnation of possible world semantics). Still, it does seem that the defense of Descartes at this point attaches too much significance to purely formal results. I now think that systems like S6 are, at some level of interpretation, incoherent. There is something distinctly fishy about the devices used in the decision procedure for S6 to secure the result that $(p)MMp$ is logically true.[32]

The decision procedures for the standard systems (T, S4, and

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[31] Op. cit., p. 11.

[32] In what follows, I assume familiarity with the admirably clear exposition of decision procedures for modal logic in G. E. Hughes and M. J. Cresswell, *An Introduction to Modal Logic* (London: Methuen, 1972), see particularly Chapters 5 and 15. For the remainder of this Section I omit explicit universal quantification over propositions, but it should be understood to apply.

S5) give formal expression to something which is at least *like* the Cartesian-Leibnizian notion that necessity is truth in every possible world, possibility truth in some possible world. As far as T and S4 are concerned, it is *only* something like it, since we must qualify the Cartesian-Leibnizian notion by saying that necessitv (possibility) is truth in every (some) *accessible* possible world. In S5 this qualification becomes vacuous, since the accessibility relation is reflexive, transitive and symmetrical, and every possible world is accessible to every other. Hence Hughes and Cresswell conclude that S5 expresses the Leibnizian conception of necessity more "directly" than do T and S4 (p. 76).

In S6 the contact with these basic intuitions is consideraly more remote. The diagram testing a formula must include at least one 'non-normal' world, a world in which the valuation rules for non-modal formulae are the same as in normal worlds, but $M\alpha$ is always assigned the value 1 (and $L\alpha$, the value 0). Every non-normal world must be accessible to at least one normal world, and every normal world is accessible to itself. But no world (including itself) is accessible to a non-normal world.

To see how this works, contrast the way *MM(p&-p)* is evaluated in T with the way it is evaluated in S6. In T, there is a consistent assignment of values which falsifies the formula without even considering alternative possible worlds:

$$\begin{array}{ll} w_1 & MM(p\&-p) \\ & 0\;0\;\;\;1001 \end{array}$$

The formula is not a logical truth in T (or S4, or S5). But in S6 there must be a non-normal world, w_2, accessible to w_1, in which *M(p&-p)* is assigned the value 1, though there can be no world accessible to w_2 in which (p&-p) is assigned the value 1:

$$\begin{array}{ll} w_1 & MM(p\&-p) \\ & 0\;0\;\;\;1001 \\ \downarrow & \\ w_2 & M(p\&-p) \\ & 1\;\;\;\;0 \end{array}$$

But *M(p&-p)* must also be assigned the value 0 in w_2, since *MM(p&-p)* is assigned the value 0 in w_1. So a consistent falsifying assignment of values is not possible. The formula is logically true in S6 (and related systems like S7 or S8).

Above I said that there was something fishy about the way this result is obtained. Actually, I think there are at least two things that are fishy about it. First, the admission of non-normal worlds, with their own special rules for the evaluation of modal formulae, means that the 'modal operators' are not being interpreted univocally in formulae which involve iterated modalities. Second, since the valuations of modal formulae in non-normal worlds are quite independent of the values of their arguments, in those or any other possible world, there is no reason at all to regard these rules for the valuation of *modal operators.* In a system like S6, not much is left of the Cartesian-Leibnizian intuition that possibility is truth in some possible world. So if *(p)MMp* were the best formula for expressing Descartes's creation doctrine, he would be not much better off than if he held the appalling *(p)Mp.*

VII

The time has now come to discuss an issue I have alluded to, but, for the sake of simplicity, have avoided discussing. Does Descartes intend to state *any* thesis about the modal status of *all* propositions? I think not, but (as noted earlier (p. 571)) opinion among Cartesian scholars has been divided. Some, like Frankfurt, have argued that Descartes does intend a universal thesis about the modal status of all propositions, viz., *(p)Mp.* And Frankfurt does not shrink from embracing the most hair-raising consequences of this doctrine. Speaking of Descartes's proofs that God exists and is not a deceiver, Frankfurt writes,

> . . . These proofs necessarily leave open the question of whether their conclusions are true "speaking absolutely" or in God's eyes. That is, they leave open the unintelligible possibility that God knows that He does not exist. This is perhaps the ultimate paradox that my interpretation entails (Frankfurt, "Creation," p. 53).

Other interpreters, like Gueroult, have thought that there must be at least some absolute impossibilities. Any state of affairs that would limit God's omnipotence or his being is absolutely impossible. So propositions like "God exists," "God is able to do what we conceive to be possible," "God is not a deceiver," and others, belong to a 'higher order' of eternal truths than do those eternal truths created by God's will.[33] Gueroult is influenced partly by a principle that Anglo-Saxon philosophers sometimes call the principle of non-vacuous contrast. If everything were possible, the possible could no longer be opposed to the impossible, and there would no longer be any sense in characterizing anything as possible. But it is important to Descartes that there should be some point in saying, for example, that material things are possible.

In this dispute it seems to me that Gueroult is more nearly right than Frankfurt, though the dispute is muddied by the fact that neither party considers seriously the possibility of expressing Descartes's creation thesis in terms of a formula involving iterated modalities. And it might be thought that once we do consider that possibility, we no longer have any reason to limit the scope of the thesis. If what Descartes is committed to is $(p)MMp$, rather than $(p)Mp$, then the need to make exceptions may not seem so pressing. We can allow that "God exists" is necessary, so long as we remember that it is only contingently necessary. The iterated modality interpretation avoids the horrendous systematic consequences of the simple modality interpretation.

But that would be too hasty a conclusion.[34] Even if we interpret Descartes's doctrine as best expressed by a formula involving iterated modalities, there is reason to make at least some exceptions, to hold that at least some eternal truths are necessarily necessary, not merely contingently necessary. After all, what's supposed to explain the necessity of those eternal truths God did create is his immutability (cf. above, text (7)). If God's immutability does not belong to a 'higher order' of eternal truth, then it's hard to see how it can serve to explain the necessity of created eternal truths. Iterated modalities offer us a way of interpreting Gueroult's talk of a 'higher order' of necessity, possibility and impossibility, and Descartes's contention that

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[33] Gueroult, M., *Descartes selon l'ordre des raisons*, vol. II (Paris: Aubier, 1953), pp. 26–29.

[34] I note that Geach resisted this conclusion when he first put forward the iterated modality interpretation (see 19, above). Geach offers no reasons for his resistance (unless saying that something is certain counts as giving a reason for it). In what follows I endeavor to support his intuition with argument.

> (20) the existence of God is the first and *most eternal* of all the truths which can be, and the only one from which all the others proceed. . . .[35]

That necessary truths about God should occupy a special position may also be suggested by reflection on the fact that, insofar as Descartes has the concept of a possible world, he thinks of it as a world God might have created.

I contend that Descartes's doctrine is best expressed by the following pair of theses:

$$(T_1)\quad (x)\,((Ex\ \&\ \text{-}LEx) \rightarrow (\varphi)\,(L\varphi x \rightarrow \text{-}LL\varphi x))$$

$$(T_2)\quad (x)\,(LEx \rightarrow (\varphi)\,(L\,\varphi x \rightarrow LL\,\varphi x))$$

Here 'E . . .' represents the one-place predicate " . . . exists." So (T_1) says that necessary truths about contingently existing beings are only contingently necessary. (T_2) claims that necessary truths about necessarily existing beings are necessarily necessary.

Note that I say that Descartes's doctrine is *best expressed* in these terms. I do not maintain that he was clear enough about the subtle distinctions involved not to give frequent encouragement to alternative readings. The texts just are not all that unambiguous. To take one example, Gueroult had cited, in favor of limiting the doctrine, a passage in the letter to Mesland of 2 May 1644 in which Descartes admits that

> (21) There are contradictions which are so evident that we cannot put them before our minds without judging them entirely impossible, like the one you suggest: that God might have made creatures independent of himself (Alquié III, 74–75).

Gueroult inferred that our judgment of impossibility would be correct. Frankfurt, on the other hand, points out that Descartes does not actually *say* the judgment would be correct, but that he does go on immediately to say that

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[35] To Mersenne, 6 May 1630, my emphasis.

> (22) If we would know the immensity of His power, we should not put these thoughts before our minds.

We are advised not to consider such propositions, Frankfurt thinks, so as to avoid being compelled to judge falsely that it was impossible for God to make creatures independent of him. On Frankfurt's reading of the texts, Descartes is committed to the exceptionless thesis, *(p)Mp*.

I find Frankfurt's interpretation of (21)–(22) inconsistent with the doctrine of judgment in the Fourth Meditation, according to which (on my interpretation) any propositions we are literally compelled to assent to must be true in an absolute sense. Otherwise God would be a deceiver. But the interpretation of (21)–(22) cannot be settled without pursuing larger issues of how Descartes's defense of reason is to be construed, for example, without discussing whether Descartes is as skeptical about the possibility of our attaining knowledge of absolute truth as Frankfurt makes him out to be. Since I have discussed those issues elsewhere,[36] I will not pursue them here, contenting myself with noting that an alternative reading of (21)–(22) is possible. I take it that Descartes would regard this proposition "It is not possible that God should make a creature independent of himself" as true, but dangerous, since it is liable to mislead us into judging (falsely) that "God's power is finite."

There are a number of relevant texts which point in a number of different directions. I abstain from surveying them and concentrate on what I think is the fundamental question, raised by Margaret Wilson:[37] "Would it have been arbitrary and ad hoc of Descartes to exclude essential truths about God from the scope of his creation doctrine?" I suggest that it would not have been, and that the rationale for the creation doctrine offered in Section V of this paper explains why. According to my interpretation, the whole problem arises from worrying about the truth-conditions of necessary truths dealing with things which may or may not exist, with essences which, according to Genesis, at one time were not actual. In the case of God, the question does not arise. God's essence is eternally actual. So there is no need to provide a foundation for essential truths about God in his immutable will. Eternal truths about God, in Descartes's view, would constitute a legitimate exception to the creation thesis.

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[36] *Descartes Against the Skeptics*, pp. 108–118.

[37] See Wilson's *Descartes*, p. 124. Wilson provides a brief and fair survey of the relevant texts, marred only by an apparent acceptance of Frankfurt's reading of the letter to Mesland. For a thorough and subtle analysis of the letter to Mesland, culminating essentially in a vindication of Gueroult's position, see J.-M. Beyssade, "Création des vérités éternelles et doute metaphysique," *Studia cartesiana* 2 (1981), pp. 86–105.

If this is the correct interpretation of Descartes's doctrine, what is the best that can be said in favor of it? We cannot, at this stage, appeal to the existence of well-understood logical systems incorporating the modal intuitions Descartes appears to have. So far as I can discover, no extant system contains theses (T_1) and (T_2). I gather that these theses could be added without inconsistency to a minimal system like T. After all, the point of developing a minimal system is precisely to allow for the possibility of variant systems containing theses *like* (T_1) and (T_2). But so far as I am aware, no one has tried to work out the details of such a system in the way that they have worked out the details of systems containing *(p)MMp*. The measures that turned out to be necessary to provide a semantics for systems like S6 do not seem a very auspicious omen for the future of such systems as those we have been contemplating in this section. But as a nonlogician, I can only leave it to the logicians to find out.

If we assume, for the sake of argument, that the task of providing a sensible semantics for systems incorporating (T_1) and (T_2) is not insuperable, there will still be other problems. For example, the key difference between necessarily necessary truths and contingently necessary truths is supposed to be that the former are truths about God and the latter are truths about his creatures. How are we to classify propositions involving both God and his creatures? For example, I assume that Descartes will hold it to be a necessary truth that (a) God is more powerful than Adam.[38] If we regard (a) as a truth about God, then (T_2) will proclaim it to be a necessarily necessary truth. But if we regard it as a truth about Adam, (T_1) will proclaim it to be a contingently necessary truth. This does not seem to be a very satisfactory result.

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[38] This example is suggested by Mesland's (see text (21)). But Mesland's example will not make the point, since God's creation of anything is sup-

I conclude that, while Descartes's doctrine may not be as bizarre as it sounds when expounded by certain of his interpreters, it faces severe difficulties even on the most charitable of interpretations.[39]

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posed to be a contingent event. I am indebted to David Stump for forcing on me a clarification of the argument of this section.

[39] The first version of this paper was read at the Chapel Hill Colloquium in October 1979. Subsequent versions were read at the University of Iowa, the Great Expectations Colloquium, The University of Nebraska, and the University of Pennsylvania. I am indebted to various members of the audiences on those occasions, but particularly to Margaret Wilson and Jim Ross.

HOW GOD CAUSES MOTION: DESCARTES, DIVINE SUSTENANCE, AND OCCASIONALISM*

IN his *Traité de l'esprit de l'homme* (1664),[1] Louis de la Forge, one of Descartes's early followers, wrote:

> I hold that there is no creature, spiritual or corporeal, that can change [the position of a body] or that of any of its parts in the second instant of its creation if the creator does not do it himself, since it is he who had produced this part of matter in place A. For example, not only is it necessary that he continue to produce it if he wants it to continue to exist, but also, since he cannot create it everywhere, nor can he create it outside of every place, he must himself put it in place B, if he wants it there, for if he were to have put it somewhere else, there is no force capable of removing it from there (*ibid.*, p. 240).

De la Forge's argument is an interesting one. He begins with two premises. The first is the doctrine of divine sustenance, that God must sustain the existence of every body, indeed, of every thing, mind or body, at every moment of its existence. Secondly, de la Forge assumes as a result, it would seem, that God causes motion in the material world by recreating bodies in different places at different times. From this de la Forge draws the conclusion that *only* God can move a body. When God sustains bodies, he must sustain them in *some* place or other; he cannot sustain them everywhere, nowhere, or in any way independently of some place or other. And so causes of motion beside God, causes of motion like our own minds are supposed to be, are neither possible nor needed; if motion and rest are direct results of God's sustenance of the material world, it would seem that there can be no room for other causes.

The position de la Forge is trying to establish here is a variety of occasionalism, and the argument I have sketched is one among many which Descartes's followers used to establish the claim that God is the only genuine cause in the material world, at least.[2] On this view,

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* To be presented in an APA symposium on Conceptions of Causality in Early Modern Philosophy, December 29, 1987. Eileen O'Neill will comment; see this JOURNAL, this issue, 580/1.

Many thanks to Roger Ariew for a prompt, careful reading of an earlier draft.

[1] Pierre Clair, ed, *Louis de la Forge: Oeuvres Philosophiques* (Paris: Presses Universitaires de France, 1974). A similar argument is also found in dialogue seven of Nicolas Malebranche, *Dialogues on Metaphysics*, Willis Doney, trans. (New York: Abaris Books, 1980).

[2] For a brief account of occasionalism among 17th Century Cartesians, see ch. 5 of Jean-François Battail, *L'Advocat philosophe Géraud de Cordemoy (1626–1684)* (The Hague: Martinus Nijhoff, 1973). There are a number of varieties of

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causal relations between two bodies, or between a mind and body, are not true causal links, but only occasional causal links which depend for their efficacy on God actually to impart the appropriate motion to the appropriate body. What is especially interesting is that de la Forge starts from what many commentators assume to be genuinely Cartesian doctrines to establish his conclusion. Descartes emphasizes in a number of places that "we have no force through which we conserve ourselves," and so for this we must turn to God, who "continually reproduces us, as it were, that is, conserves us" [Pr I 21].[3] Descartes appeals to this doctrine of divine conservation in proving his laws of nature, both in *Le Monde* and in the *Principia Philosophiae*, arguing that God is the first and continuing cause of motion in the world, and that acting with constancy in preserving his material creation, he must necessarily sustain the world in such a way that certain general constraints on motion are satisfied; quantity of motion is thus conserved, as is motion along a straight path [Pr II 36–42]. The close connection between God's sustenance of the world and his role as cause of motion in the inanimate world have led a number of commentators to see something like de la Forge's view in Descartes, the view that God's role as a cause of motion in the world is inseparable from his role as a sustainer of the world, that God causes motion by creating bodies in different places at different times.[4]

De la Forge's premises seem to belong to Descartes as well. But, if so, then it would appear that, like it or not, Descartes too must be committed to de la Forge's conclusion that God can be the *only* cause of motion in his material world, that, contrary to our "most certain and most evident experience," mind cannot really cause mo-

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occasionalism. Here I am only concerned with the claim that God is the only genuine cause of motion in the material world.

[3] The numerous references to Descartes's texts will be given in the body, for the most part, using the following abbreviatons. AT: Charles Adam and Paul Tannery, eds., *Oeuvres de Descartes* (Paris: J. Vrin, 1964–1978); CSM: John Cottingham, Robert Stoothoff, and Dugald Murdoch, trans., *The Philosophical Writings of Descartes* (New York: Cambridge, 1985); K: Anthony Kenny, trans., *Descartes: Philosophical Letters* (Minneapolis, Minn: University Press, 1981). The original language text in AT will be cited first, followed by a translation in CSM or K (if available). The one exception to this is the *Principia Philosophiae*, abbreviated 'Pr', and cited by part and section number. The original Latin can be found in AT VIII A, and translations in CSM I.

[4] See e.g., Jean Wahl, *Du rôle de l'idée de l'instant dans la philosophie de Descartes* (Paris: Felix Alcan, 1920); Martial Gueroult, "The Metaphysics and Physics of Force in Descartes," in Stephen Gaukroger, ed., *Descartes: Philosophy, Mathematics and Physics* (Sussex: Harvester Press, 1980), pp. 196–229, esp. 218–220; G. Hatfield, "Force (God) in Descartes' Physics," *Studies in History and Philosophy of Science*, X (1979): 113–140, esp. 127.

tion in the world [AT v 222 (K 235)]. This is the question I would like to examine in this essay. In the end, I shall argue that, when we understand Descartes's doctrine of divine sustenance and of the way God enters the world as a cause of motion, we shall see that, wherever de la Forge's views lead him, Descartes need not be committed to occasionalism, at least not in this way. When we understand just how God causes motion, we shall see that Descartes's God can leave plenty of elbow room for other causes to produce their effects, indeed, produce them as directly as God himself does.

I.

It will be helpful to begin the story with a brief discussion of Descartes's doctrine of divine sustenance. Descartes writes in Meditation III:

> All of the time of my life can be divided into innumerable parts, each of which is entirely independent of the others, so that from the fact that I existed a short time ago, it does not follow that I ought to exist now, unless some cause as it were creates me again in this moment, that is, conserves me [AT VII 49 (CSM II 33)].

Now, Descartes argues, "plainly the same force and action is needed to conserve any thing for the individual moments in which it endures as was needed for creating it anew, had it not existed" [AT VII 49 (CSM II 33)]. Clearly such a power is not in us; if it were, Descartes reasons, I would also have been able to give myself all of the perfections I clearly lack [AT VII 168 (CSM II 118)]. And so he concludes that it must be God that creates and sustains us [AT VII 111, 165, 168, 369–370 (CSM II 80, 116, 118, 254/5); Pr I 21]. This conclusion, of course, holds for bodies as well as for us. It is not just *souls*, but *all* finite things that require some cause for their continued existence. And, as with the idea of ourselves, "when I examine the idea of body, I perceive that it has no power [*vis*] in itself through which it can produce or conserve itself" [AT VII 118 (CSM II 84); cf. AT VII 110 (CSM II 79)]. And so we must conclude that the duration of bodies, too, must be caused by God, who sustains the material world he created in the beginning.

Descartes conceives of God's continual sustenance of his creatures as their *efficient* cause: "I should not hesitate to call the cause that sustains me an efficient cause" [AT VII 109 (CSM II 79)]. But God's causality here is in one respect importantly different from other efficient causes that we are familiar with from our experience. In reply to Gassendi's *Fifth Objections*, Descartes distinguishes between two sorts of efficient causes, a *causa secundum fieri*, a cause of becoming, and a *causa secundum esse*, a cause of being. Roughly speaking, as Descartes undertands the notions, a *causa secundum* *esse* is a cause which must continue to act for its effect to continue, unlike a *causa secundum fieri*, which produces an effect that endures, even after the cause is no longer in operation or even in existence. An architect, thus, is the cause of becoming with respect to a house, as is a father with respect to his son. But Descartes claims

> the sun is the cause of the light proceeding from it, and God is the cause of created things, not only as a cause of becoming, but as a cause of being, and therefore must always flow into the effect in the same way, in order to conserve it [AT VII 369 (CSM II 254/5)].

And, so just as we ordinarily think that the sun must continue its illumination for daylight to persist, so must God continue his activity in order for the world and its motion to be sustained.[5] This continual sustenance is also unlike the more ordinary efficient causes insofar as it requires a kind of power beyond the capacities of created things. Whereas finite things may be able to stand as the efficient causes *secundum fieri* of things in the world, only God, strictly speaking, can stand as their cause *secundum esse*. As we noted earlier, in *Meditation* III Descartes declares that: "plainly the same force and action is needed to conserve any thing for the individual moments in which it endures as was needed for creating it anew, had it not existed" [AT VII 49 (CSM II 33)]. From this Descartes infers that: "it is also one of those things obvious by the light of nature that conservation differs from creation only in reason" [AT VII 49 (CSM II 33)]. That is, the activity and power needed to sustain a thing in its existence is identical to the activity and power necessary to create anything from nothing [cf. also AT VII 165, 166 (CSM II 116, 117)]. Elsewhere he puts the point a bit differently, suggesting that conservation is to be understood as the "continual production of a thing" [AT VII 243 (CSM II 169); cf. Pr II 42], or, more guardedly, suggesting that God *as it were (veluti)* continually reproduces his creatures [Pr I 21; cf. AT VII 110 (CSM II 79)].

In the following section, we shall investigate how Descartes's God causes motion while sustaining the world. But, before turning to that question, I would like briefly to discuss an issue closely related to the questions under discussion here, that of temporal atomism. A number of commentators take Descartes's language quite literally when he says that God must continually recreate his creatures. On their view, Cartesian time must, as a result, be a series of discrete timeless instants, created one after another like the frames of a motion picture.[6] Such a view seems inevitably to lead to a position like de la Forge's. The cartoonist creating an animated cartoon can cause his creatures to move only by drawing them in different positions in successive frames; so too for God, it would seem, were we to conceive of him as the grand cartoonist with respect to his creation. In this way, God's sustenance would seem to be inseparable from his role as cause of motion, and all genuine causes of motion other than God would seem to be frozen out.

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[5] Descartes does concede, under challenge, that the sun may not be an especially good example of a *causa secundum esse*. See AT III 405, 429 (K 115/6).

But it is not at all clear that Descartes held such a position. In a recent study, Jean-Marie Beyssade[7] has argued that Descartes's God sustains the continuously flowing time of our experience. On Beyssade's view, time for Descartes is much like body, infinitely divisible and not composed of any ultimate elements, elements like the durationless temporal atoms are supposed to be. Beyssade does not deny, of course, that Descartes is concerned with timeless instants in a number of important contexts, and, indeed, that he even talks about God conserving bodies as they exist at a given instant [AT XI 44 (CSM I 96); Pr II 39]. But, Beyssade argues, such instants are not, strictly speaking, *parts* of duration. A hunk of extended substance can be divided into innumerable parts. But, for these divisions to be genuine *parts* of a body, they must be extended as well. Points, lines, surfaces, and geometrical objects that lack extension in length, width, and breadth, are not *parts* of a body, but *limits* or *boundaries*. So, Beyssade suggests:

> In the same way, every duration or part of duration contains a before and after . . . ; the instant is its limit or boundary. If we are not mistaken, Descartes always takes this word ['instant'] and its Latin original *'instans'* in the strict sense of a limit (*ibid.*, p. 348; cf. p. 353).

Durations, no matter how small, can be parts of an enduring world, and thus can be candidates for God's sustaining activity. But, although there may be instants *in* duration as boundaries of finite durations, instants, Beyssade suggests, cannot be *parts* of an enduring world; they cannot compose durations, nor can we intelligibly talk about God creating a single instant by itself without creating the duration it serves to bound, any more than we can talk about God creating a two-dimensional surface, a mode of body, without the body that it bounds [AT VII 250/1, 433 (CSM II 174, 292)].

With this in mind, it is easy to see that there is really nothing in

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[6] See, e.g., the references cited in note 4.

[7] *La philosophie première de Descartes* (Paris: Flammarion, 1979), pp. 129–143.

Descartes's texts that unambiguously implies temporal atomism. The idea that all the parts of time are independent, the view we saw earlier in Meditation III, certainly does not; the parts of time in question there might plausibly be read as genuine parts of time, parts with duration, parts which are independent in the sense that God could create any stretch of time without creating preceding or succeeding portions of time. One can give similar readings to other passages in which Descartes talks about the independence of the present time from other moments or moments from one another. Even where Descartes talks of creating the things anew at every moment, even where Descartes makes it clear that God sustains things as they are in a timeless instant, there is no need to attribute temporal atomism to him.[8] To say that God recreates the world at every instant is to say that every instant can be regarded as the beginning, as the boundary of a newly created world. But, although every instant can be regarded as a moment of creation, it does not follow that what is being created is a bare instant or a sequence of bare instants, or that God could create an atemporal instant without creating a duration for that instant to bound.

But, just as Descartes was not committed to temporal atomism, neither was he committed to its denial; I know of few passages that cannot be plausibly interpreted either way. Indeed, I know of no passage to suggest that Descartes was particularly *interested* in the question of temporal atomism, one way or the other. And so it seems improper to argue from Descartes's supposed temporal atomism to the claim that God causes motion through recreating bodies in different positions at different times. If we want to know how God causes motion for Descartes, we should face the question directly.

II.

In presenting his account of God as continual sustainer of the world, Descartes did not think he was telling his readers anything they had not already heard. As far as he was concerned, he was appealing to an old and widely accepted doctrine with which his audience could be expected to be both familiar and generally sympathetic. When in the *Fifth Objections* Gassendi challenged his appeal to a conserving God [AT VII 300 (CSM II 209)], Descartes responded: "When you deny that to be conserved we require the continual influx of a first cause, you deny something that all metaphysicians affirm as obvious" [AT VII 369 (CSM II 254); cf. AT VI 45 (CSM I 133)]. And, in defending himself against Gassendi's criticisms, he seems to have turned directly to his copy of St. Thomas Aquinas.[9] God's sustenance of this world of created things is explicitly discussed in the *Summa Theologiae* I, q 104, a 1, and this passage may be the source of Descartes's answer to Gassendi. Like Descartes, Aquinas distinguishes between causes *secundum fieri* and *secundum esse,* and appeals to the same examples Descartes does—the builder of a house, the parent of a child, and the sun as illuminator—to clarify the sense in which God is the cause of the world as enduring [ST I, q 104, a 1 c]. And, although Aquinas does not say exactly that God's activity in sustaining the world is identical with his activity in creating it, many of Descartes's contemporaries would have been happy to agree with Descartes that "this conservation is the very same thing as creation, differing only in reason."[10]

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[8] For the former formulations see AT VII 49, 109 (CSM II 33, 78/9); for the latter see AT XI 44, 45 (CSM I 96/7), Pr II 39.

In his monumental commentary on the *Discours,* Étienne Gilson[11] noticed this similarity between Descartes and Aquinas. But Gilson also noted an apparent (and important) difference as well:

> The being of the things Descartes's God conserves is so different from that which St. Thomas's God conserves, that there is a profound difference between their two notions of continual creation. The Thomist God conserves the being of a world of substantial forms and essences. . . . But, on the contrary, in Cartesianism, there are no substantial forms any more . . . (*ibid.*, p. 341).

Gilson goes on to argue that, lacking substantial forms, Descartes, unlike the scholastic, is doomed to a movie-show world of still frames, mocking the continuity of time and motion that the scholastic is genuinely entitled to. Gilson's full argument is too complex to enter into here. But I would like to explore his initial observation a bit.

Descartes does, for the most part, reject substantial forms and this does indeed make a difference, as Gilson emphasizes. But what difference it makes depends upon how the notion is understood, and what it is that takes the place of the absent forms. Now, the notion of a substantial form is a basic notion in Aristotelian thought, and there are important differences of conception among scholastic thinkers with regard to that notion. But, to understand the importance of the rejection of substantial forms to Descartes's thought, we must begin with an account of what the notion meant to him.

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[9] In December 1639, Descartes tells Mersenne that he owns "*vne Somme de S. Thomas,*" though it is not altogether clear to me whether this means a copy of Aquinas's *Summa Theologiae* or a *summary of* Aquinas. See AT II 630 (K 69).

[10] Guilelmus Amesius, *Medulla theologica* (1628), quoted in Heinrich Heppe and Ernst Bizer, ed., *Die Dogmatik der evangelisch-reformierden Kirche* (Neukirchen, kreis Moers: Buchhandlung des Erziehungsvereins, 1935), p. 208. For other of Descartes's contemporaries on the question, see Heppe, *Dogmatik,* Locus XII; G. T. Thomson, *Reformed Dogmatics,* Heinrich Heppe, trans. (London: Allen and Unwin, Ltd., 1950), ch. XII; Étienne Gilson, *Index Scholastico-Cartesien* (Paris: J. Vrin, 1979), §§64, 112.

[11] *Discours de la méthode: texte et commentaire* (Paris: J. Vrin, 1967).

In very general terms, a substantial form is that which, joined to matter (the *materia prima* of the scholastics, ultimately) results in a complete substance. But, more substantively, substantial form is that from which the characteristic behavior of the various sorts of substances derives. And, so Descartes notes, writing to his then disciple Henricus Regius in January 1642, "they [i.e., forms] were introduced by philosophers to explain the proper action of natural things, of which action this form is the principle and the source" [AT III 506 (K 129)]. Or, as the Conimbrian Fathers wrote in a book Descartes likely learned from as a schoolboy,

> There are individual and particular behaviors [*functiones*] appropriate to each individual natural thing, as reasoning is to human beings, neighing is to horses, heating to fire, and so on. But these behaviors do not arise from matter. . . . Thus they must arise from substantial form (Gilson, *Index*, §209).

More concretely, Descartes views substantial forms as substances of a sort: "by the name 'substantial form' I have understood a certain substance joined to matter, and with it composing something whole that is merely material" [AT III 502 (K 128)]. And the sort of substances they are is mental substance, Descartes thinks, "like little souls joined to their bodies" [AT III 648 (K 135)].[12] And so Descartes characterizes the scholastic account of heaviness which he himself once held as follows:

> But what especially showed that the idea I had of heaviness was derived from that of mind was the fact that I thought that heaviness bore bodies toward the center of the earth as if it contained in itself some knowledge of it [i.e., the center of the earth]. For this could not happen without knowledge, and there cannot be any knowledge except in a mind [AT VII 442 (CSM II 298)].

If substantial forms are supposed to explain the characteristic behavior of bodies of various sorts, then we must be thinking of them as intentional entities, agents of a rudimentary sort, things capable of forming intentions and exercising volition, little souls joined to matter. And so the scholastic doctrine of form and matter is, in a sense, just the image of the Cartesian human being, an unextended soul united to extended body and projected out onto the material world. Indeed, Descartes often uses the supposed familiarity of the scholastic model of heaviness (which everyone would have learned at school) to persuade those who have trouble with mind–body interaction on his view that they already understand how interaction is possible; if one can understand the scholastic account of heaviness, then one can understand how the soul can move the body, Descartes reasons, since the two cases are just the same.[13]

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[12] The remark in question relates to real qualities, strictly speaking, qualities that follow directly from forms. But, in his polemics against the scholastics, Descartes drew no distinction between substantial forms and real qualities.

It should be evident from Descartes's account of substantial form that he does not reject forms altogether. Given that the human mind is the very model of a form, it is not surprising to find Descartes saying from time to time that the human soul is "the true substantial form of man" [AT III 505]; indeed, it is "the only substantial form" he recognizes [AT III 503; cf. AT IV 346, AT VII 356 (CSM II 246)]. Descartes from time to time also uses scholastic terminology and talks of the soul "informing" the body [AT IV 168 (K 158); AT X 411 (CSM I 40)]. In this sense, Gilson perhaps overestimates the difference between the world Descartes's God sustains and that which Aquinas's sustains, insofar as both contain at least some substantial forms.[14]

But it is significant that Descartes's world has many fewer forms than Aquinas's does, that Descartes rejects all forms but those which pertain to human beings.[15] This raises something of a problem for Descartes, however. The substantial form was that in terms of which the characteristic behavior of a body of a certain sort was to be explained. But, without form, what is to explain why horses neigh and fire heats, why cannon balls fall and smoke rises? In one sense, the replacement for explanation in terms of form is explanation in terms of size, shape, and motion—mechanical explanation. Indeed so, but the story does not end there. In order to explain the behavior of a body (say a cannon ball) mechanistically, we must know more than just the size, shape, and motions of its parts and the surrounding medium; we must also know the relevant laws of motion, how a body as such can be expected to behave, what results when two bodies of given sizes, shapes, and motions encounter one another in collision, etc. Descartes replaces the multiplicity of Aristotelian substances, each with its own form and distinct characteristic behavior, with one kind of body which fills the entire universe and behaves everywhere in accordance with the same laws [cf. Pr II 23]. But, in the absence of scholastic substantial forms, Descartes must find some way of explaining the characteristic behavior of material substance, the laws of motion. And it is here that God enters as the "universal and primary [cause of motion], which is the general cause of all motions there are in the [physical] world" [Pr II 36]. God is the cause of motion, what takes the place of the scholastic forms Descartes banished from the inanimate world of nonhuman beings.

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[13] For a fuller account of this, see §II of Daniel Garber, "Understanding Interaction: What Descartes Should Have Told Elisabeth," *Southern Journal of Philosophy*, XXI supp. (1983): 15–32.

[14] For a recent discussion of the human soul as substantial form in Descartes, see Marjorie Grene, "Die Einheit des Menschen: Descartes unter den Scholastikern," *Dialectica*, XL (1986): 309–322.

[15] For the still standard account of Descartes' rejection of forms, see Gilson, *Études sur le rôle de la pensée médiévale dans la formation du système cartésien* (Paris: J. Vrin, 1975), pp. 141–190.

But this, of course, leads us back to the question I posed earlier in this paper: How does God cause motion in the world? And how is God's role as cause of motion related to his role as sustainer of body?

To answer this first question, we must, I think, reflect on how souls and the other forms Descartes attributed to the scholastics were thought to cause motion. We must keep in mind here that the issue is under a cloud, so to speak, and it may turn out that, because of an argument like the one de la Forge gave, Descartes is not entitled to hold that the human soul causes motion. But, *prima facie* and despite the doubts of a number of his readers, Descartes certainly thought the question relatively unproblematic. Writing to Arnauld on 29 July 1648, Descartes noted:

> That the mind, which is incorporeal, can impel a body, is not shown to us by any reasoning or comparison with other things, but is shown daily by the most certain and most evident experience. For this one thing is among the things known *per se*, which we obscure when we try to explain through other things [AT V 222 (K 235)].

The mind can cause motion in a body, Descartes holds; it is something we know through experience directly, something we cannot explain in other terms. Insofar as we comprehend it, it is because "we have within us certain primitive notions, on the model of which we form all our other knowledge," Descartes explains to Elisabeth [AT III 665 (K 138)]. And, Descartes goes on to explain, we understand the schoolman's substantial forms to work in exactly the same way; indeed, as I noted earlier, the understanding we have of forms derives from the notions we were given to understand how human mind works on body.

Descartes is not very informative about just how mind (or form) moves body; on his view, there is not much that *can* be said, other than to direct our attention to the experience we all have that is supposed to make it all clear.[16] But, although there is not much we can say, there is no confusing the sense in which mind causes motion in a body with the way God sustains the body that mind supposedly moves. One of the axioms Descartes uses in the geometrical presentation of his arguments appended to the *Second Replies* reads as follows: "It is greater to create or conserve a substance, than it is to create or conserve the attributes or properties of a substance" [AT VII 166 (CSM II 117)]. The passage is not without its difficulties.[17] But the clear sense is that Descartes wants to distinguish causes that change the modes or properties of a thing (modal causes, as I shall call them) from causes that create or sustain the very being of a substance (substantial causes, perhaps). God, sustaining the world, is clearly a substantial cause. But minds are clearly not; insofar as they cause changes in the motion of bodies, they at best can count as modal causes. And, insofar as substantial forms are understood on the model of souls acting on bodies, Descartes would have had little trouble classifying them, with minds, as modal causes; they are causes of motion, a mode in bodies assumed to be sustained by the divine sustainer who is the unique substantial cause.

God enters Descartes's physics to do the business substantial forms did in the Aristotelian system, as he understood it, to cause bodies to behave in their characteristic ways. And, I claim, when doing the business of forms, Descartes's God is understood to cause motion in just the way forms were taken to do it, that is, on Descartes's account, in just the way that we do it: by way of an impulse that moves matter in a way that we can comprehend only through immediate experience. This is not at all clear as late as 1644 when, in proving his laws of nature in the *Principia*, Descartes's account of God as cause of motion is deeply (and obscurely) intertwined with his account of God as sustainer of the world [Pr II 36–42]. But, by April 1649, Descartes wrote to Henry More:

> Although I believe that no mode of acting belongs univocally to God and to his creatures, I confess nevertheless, that I can find no idea in my mind which represents the way in which God or an angel can move matter, which is different from the idea that shows me the way in which I am conscious that I can move my own body through my thought [AT V 347 (K 252)].

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[16] This, in any case, is what he insisted on in writing to Elisabeth. See AT III 663–668, 690–695 (K 137–143). What exactly he meant here is not entirely clear.

[17] The passage raises an obvious question about the relation between an attribute and a substance, a question the young Burman raised to Descartes in coversation. See AT V 154, and John Cottingham, trans. and ed., *Descartes' Conversation with Burman* (New York: Oxford, 1976), pp. 15, 77–80.

And, so Descartes suggests to More, God is conceived to move bodies in just the way we do, using the same primitive notion we use to understand how we move our own bodies.

If this is how we conceive of God as a cause of motion, then, it would seem, we are conceiving of him as a *modal cause* when it comes to motion. Conceived as such, there would appear to be a distinction between God as sustainer of the world, a substantial cause keeping things in existence, and God as cause of motion, a modal cause causing bodies to have the particular motion they have, determining, at least in part, their modes. The difference between these two roles God plays for Descartes comes out again in the correspondence with More. In his letter of 5 March 1649, More asked Descartes if "matter, whether we imagine it to be eternal or created yesterday, left to itself, and receiving no impulse from anything else, would move or be at rest?" [AT v 316]. Descartes answers in his letter of August 1649: "I consider 'matter, left to itself, and receiving no impulse from anything else' as plainly being at rest. But it is impelled by God, conserving the same amount of transference in it as he put there from the first" [AT v 404 (K 258)]. The picture that comes through here is a simple one. Bodies can be conserved with or without the divine impulse. Without the impulse, they are at rest; with it, in motion. God's conservation of body seems separable from his role as cause of motion, and as cause of motion, he seems to act as we would in the circumstances; God's motion seems to result from a divine act of will, a divine shove.

III.

Now that we understand something of how God causes motion, we can return to the question originally posed and offer an answer.

As de la Forge construed Descartes's views on God, continual recreation, and God's role as cause of motion, Descartes seems pushed inevitably toward occasionalism and the view that God is the only genuine cause of motion in the world; if God causes motion by recreating bodies in different places at different times, then there seems to be no room for finite causes to act. But by now it should be clear why Descartes need not be committed to such a view.

I have argued that, for Descartes, God enters as a cause of motion in order to replace the scholastic's substantial forms, and, in that role, he can (and, in the More letters, at least, *is*) construed as acting in just the way forms were thought to cause motion, that is, in just the way *we* cause motion. As such, God both sustains bodies in their being and sustains bodies in their motion. But, it is important to note, *these two activities seem to be quite distinct;* in the one case, God is acting as a modal cause, in the other, as a substantial cause.

This is an extremely important observation. There is no substantial cause but God, nor can there be, since no other being has the ability to create and sustain the universe. But, although God is a modal cause with respect to motion, there is no reason to hold that God is the *only* such cause. God is conceived to act as we do in causing motion; just as the finite cause of motion does not exclude others, so the fact that God causes motion does not seem to exclude other causes. This seems true even when we are talking about causing motion *in the same body*. Just as two human beings can exert their contrary impulses on the same bit of matter, so can we impose an impulse contrary to the one God imposes. Indeed, we do so every time we lift a stone, on which God is imposing an impulse to move toward the center of the earth.

And so Descartes would have to agree with de la Forge that God cannot sustain bodies that are in no place at all or in indeterminate places; the very possibility is absurd. But, I think Descartes might insist, although God sustains bodies that *have* place, it is not the act of sustaining them that *gives* them place. What gives them place and the motion that puts them in different places at different times is impulse or the lack thereof, a cause quite distinct from that by which bodies are sustained. These impulses may come from God himself, but they might come from other causes, like our own minds [cf. AT v 403/4 (K 257)]. And, when they come from God, they are not to be identified with the cause by which he sustains the bodies he moves.

There are a number of important questions relevant to the topic at hand which space will not permit us to discuss. Most importantly, it would be valuable to discuss the relations between the conception of motion and its divine cause which I have been developing with the discussion of motion and rest and their laws in part II of the *Principles* and in ch. 7 of *The World*—the sense in which motion and rest are distinct and the sense in which they are not, the sense in which motion and rest are states, and the way in which motion and rest give rise to forces that come into play at the time of collision. My story will not be complete until we see how the way in which Descartes's immutable God causes motion leads him to the conception of motion (and its associated forces and laws) which underlies his program in natural philosophy.

But, incomplete as my preliminary sketch of Descartes's position may be, it allows us to see one important feature that differentiates Descartes's metaphysic of motion and his use of God as cause of motion from that of his avowedly occasionalist followers. What lies behind occasionalism as advanced by de la Forge and by many Cartesians of his generation is a deep worry about causality in the world of finite things; what comes up again and again is the view that finite things are incapable of any genuine causal efficacy, that producing an effect is beyond the power of any finite thing. God enters as the *only* being capable of producing any change in the world.[18] Descartes's view is quite different. Descartes *never* rejects finite causes as such; indeed, it is on the model of one particular finite cause, us, that *all* causes are understood, conservation excepted.[19] When God enters as a cause of motion, it is simply on account of the fact that some finite causes needed to do the job are not available. But, even when God undertakes this task, it seems to me that Descartes can quite well hold that finite causes of motion are in no way squeezed out. Mind, indeed, can remain as direct a cause of motion for Descartes as God himself.

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Part VII
Mind and Body

[18]

Descartes and the Action of Body on Mind

By

NICHOLAS JOLLEY (LA JOLLA)

Zusammenfassung

In diesem Aufsatz versuche ich, die innere Kohärenz der Cartesischen Lehre von der Wechselwirkung zwischen Leib und Seele nachzuweisen. Ich versichte jedoch darauf, das Prinzip, daß die Ursache ebenso viel Realität enthalten muß wie die Wirkung, selbst und erst recht Descartes' Anwendung derselben auf die Ideen zu verteidigen. Mein Bemühen um die innere Kohärenz der Cartesischen Position erklärt die ausschließliche Blickrichtung auf nur eine Richtung der Wechselwirkung. Unter der Voraussetzung der Cartesischen Prinzipien kann sich durch die Annahme von durch Wollen verursachter physischer Veränderung kein Problem ergeben; denn hier kommt das Augustinische Prinzip Descartes zur Hilfe. Nach Augustins Prinzip ist nämlich das Geistige vollkommener und daher realer als das Physische. Heutige Philosophen mögen Descartes' Auffassung der willentlichen Bewegungen geheimnisvoll finden, doch geschieht das aus Gründen, die außerhalb des Cartesischen Systems liegen.

Recent writers have displayed a refreshing scepticism with regard to the old 'scandal' of Cartesian interactionism. Louis Loeb, in particular, has challenged the traditional idea that there is an internal inconsistency in Descartes's system on this issue[1]. Loeb's strategy is to analyze Descartes's teaching concerning causality, and show that, properly understood, it does not preclude mind-body interaction. Such a strategy seems correct, but I believe that Loeb's defense is not adequate as it stands; for Descartes's position is complicated not only by his claim that reality admits of degrees but also by his key distinction between the formal and objective aspects of ideas. In this paper I shall argue that, even when these complications are recognized, Descartes's position emerges largely unscathed; at most his causal principle is a source of trouble only for a strong version of interactionism. Contrary to the tendency of much modern discussion, I shall focus exclusively on the causation of mental events by bodies, for as we shall see, there is reason to believe that this is the real test case for the internal coherence of Cartesian interactionism.

Abbreviations

AT = *Oeuvres de Descartes*, ed. Charles Adam and Paul Tannery, 13 vols., Paris, 1897–1913; reprinted Paris, 1964–73; – CSM = *The Philosophical Writings of Descartes*, trans. John Cottingham, Robert Stoothoff and Dugald Murdoch, 2 vols., Cambridge, 1985; – K = *Descartes: Philosophical Letters*, trans. Anthony Kenny, Oxford: 1970.

I have followed the cited translations.

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[1] Louis E. Loeb: *From Descartes to Hume: Continental Metaphysics and the Development of Modern Philosophy*, Ithaca and London, 1981, pp. 134–49. For a rather different challenge to the traditional view, see Robert C. Richardson: *The "Scandal" of Cartesian Interactionism*, in: *Mind* 91 (1982), pp. 20–37. The views of Loeb and Richardson have been recently criticized by Daisie Radner: *Is There a Problem of Cartesian Interaction?*, in: *Journal of the History of Philosophy* 23 (1985), pp. 35–49. Radner's article has in turn prompted replies from Loeb und Richardson and a further rejoinder from Radner: *Journal of the History of Philosophy* 23 (1985), pp. 221–36.

Studia Leibnitiana, Band XIX/1 (1987)
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The 'Adequate Reality' Principle

Those who are shocked by the scandal of interactionism are not always very clear just what the scandal is supposed to be. Mind-body interaction is rumored to be unintelligible, but as it stands, this is a vague accusation. When critics try to explain it, they usually appeal to the fact that in Descartes's metaphysics mind and body are much too unlike for causal flow between then. As Loeb remarks,

> "it is somewhat shocking to see such objections raised after Hume, without any attempt to reinstate the notion that there must be some specific degree of qualitative similarity between cause and effect"[2].

The puzzling nature of such objections, however, helps us to identify the real nature of the accusation: Cartesian interactionism is scandalous, not because it shocks contemporary intuitions about causality, but because it flouts Descartes's own teaching on the subject. In particular, Descartes is supposed to subscribe to a version of the causal likeness principle which precludes interaction between substances as heterogeneous as mind and body. Yet, as Loeb also points out, Descartes does not in fact impose this particular restriction on causal relations[3]. Although in the *Conversation with Burman* Descartes endorses the common axiom: "the effect is like the cause"[4], he nowhere states that they must be alike in essence. Indeed, in a letter to Clerselier, he explicitly repudiates the suggestion that the diversity in nature of mind and body poses any kind of problem for interaction[5].

Descartes does not have a causal likeness principle if this is taken to imply that cause and effect must be alike in essence. But he does make a number of statements which, obscure as they are, seem to impose some other restriction on causal relations:

(1) "It is manifest by the natural light that there must be at least as much reality in the efficient and total cause as in the effect of that cause."
(2) "The fact that 'there is nothing in the effect which was not previously present in the cause, either in a similar or in a higher (eminentiori) form' is a primary notion which is as clear as any that we have."
(3) "Whatever reality or perfection there is in a thing, is present either formally or eminently in its first and adequate cause."
(4) "It is certain that there is nothing in the effect which is not contained formally or eminently in its EFFICIENT and TOTAL cause."
(5) " . . . there can be nothing in the effect which is not pre-existent in the cause"[6].

These statements raise an obvious difficulty which is exacerbated by the obscurity of the Scholastic terminology in which they are couched. The difficulty is to decide whether they are all intended to come to the same thing. Superficially, it is tempting to suppose that we are confronted by at least two non-equivalent principles here. Statements (2) through (5) all suggest that the effect must somehow pre-exist in the cause; we might infer, then, that Descartes is committed to the principle that if the effect is F, the cause must also be F. Radner goes further: she suggests that Descartes is committed to a stronger thesis which she terms the communication principle: in causal transactions a property is communicated or transferred by the cause to the effect rather in the way that a baton is passed on from runner to runner in a relay race[7]. However, neither of these requirements seems to be imposed by (1). To say that the cause must contain at least as much reality as the effect certainly does not imply that anything need be communicated by the cause to the effect. Indeed, it does not even seem to entail that if the effect is F, the cause must also be F.

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[2] Loeb: *From Descartes to Hume*, p. 137.

[3] Ibid., p. 140.

[4] AT V, p. 56; John Cottingham (trans.): Descartes: *Conversation with Burman*, Oxford, 1976, p. 17.

[5] 12 January 1646, AT IX–1, p. 213.

[6] (1) Third Meditation, AT VII, pp. 40–1, CSM II, p. 28; (2) Second Replies, AT VII, p. 135, CSM II, p. 97; (3) Arguments Drawn up in Geometrical Fashion (Second Replies), AT VII, p. 165, CSM II, p. 116; (4) Descartes to Mersenne, 31 December 1640, AT III, p. 274, K, p. 91; (5) Descartes to Hyperaspistes, August 1641, AT III, pp. 427–8, K, p. 114.

We can bring the problem to a sharp focus by concentrating on one of Descartes's hand-picked examples of causality. In his first proof of the existence of God in the Third Meditation, Descartes concludes that his idea of God can be caused by nothing less than God himself[8]. Here, then, we have a cause which is an infinite substance, and an effect which is a mode of a finite substance. Just how degrees of reality are to be measured in Descartes's philosophy is a controversial issue to which we must return; but for the present it does not matter. By any standard of reality that Descartes is likely to adopt, it is clear that God has it to a maximum; there is no doubt that the cause here possesses at least as much reality as the effect: thus (1) is obviously satisfied. But it might be objected that in this case we have something in the effect which does not pre-exist in the cause. For the effect is not only finite: it is also a mode; and neither of these properties belongs to God. Thus it might be argued that (2) through (5) are not satisfied in this case.

The temptation to suppose that we are confronted by more than one principle should, nonetheless, be resisted. What scrutiny of (2) through (5) suggests is that the pre-existence requirement is weaker than it appears to be, for it is hedged around with a significant qualification: Descartes allows that the effect may inhere 'eminently' in the cause. The concept of 'eminence' is crucial, but it is of course obscure. Kenny helpfully suggests that to possess a property F 'eminently' is not to possess F itself but rather to possess some grander property G[9]. An uncontroversial illustration would be the following. Suppose that we assume that being six feet tall is a grander property than being five feet tall; a six-footer may then be said to possess 'eminently' the property of being five feet tall. Fortunately, the application of the concept of eminence to Descartes's own example of the idea of God seems equally straightforward. God is not finite nor is he a mode, but he possesses these properties 'eminently' inasmuch as he has the grander properties of infinity and substantiality. Thus when Descartes's qualification concerning eminence is taken into account, the divine origin of the idea of God no longer constitutes a counterexample to the principle that whatever is in the effect must pre-exist in the cause. It is true that this qualification is missing in the case of (5), but it is natural, I think, to suppose that this is simply an imprecise statement of a principle expressed in (2) through (4)[10].

On the proposed interpretation, then, Descartes is not committed to the communication principle: to say that God is "eminently" finite and "eminently" a mode is not to say that he communicates or transfers these properties to the idea in Descartes's mind. Moreover, and more controversially perhaps, the proposed interpretation implies that Descartes is not committed to the principle that if the effect is F, the cause must also be F. As we have seen, the effect can inhere eminently in the cause, and to possess a property eminently is not to possess the property itself. Thus once the eminence qualification is introduced, the pre-existence claim is deprived of most of its sting: indeed, its effect is to collapse (2) through (5) into (1)[11]. It remains to give a name to this principle, and since talk of causal likeness is misleading, I propose to follow Bernard Williams and speak of the "adequate reality" principle[12].

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[7] Radner: *Is There a Problem?*, esp. p. 41. This claim is essential to her defense of the traditional view that Cartesian interactionism is incoherent.

[8] AT VII, p. 45, CSM II, p. 31.

[9] Anthony Kenny: *Descartes: A Study of his Philosophy*, New York, 1968, p. 141.

[10] Radner: *Is There a Problem?*, holds that Descartes is committed to the pre-existence principle by virtue of his (alleged) commitment to the communication principle. See p. 44.

Degrees of Reality

Ever since Descartes's own time, his critics have found the "adequate reality" principle obscure. For the principle implies that reality admits of degrees, and critics have wanted to know how this could be the case. When Descartes was challenged by Hobbes on precisely this point, he was brusque in his reply, but he did offer some help: he indicated that his criterion was in some sense independence:

> "I have made it quite clear how reality admits of more and less. A substance is more a thing than a mode; if there are real qualities or incomplete substances, they are things to a greater extent than modes, but to a lesser extent than complete substances; and finally, if there is an infinite and independent substance, it is more of a thing than a finite and dependent substance. All this is completely self-evident[13].

In the "Arguments arranged in geometrical fashion" at the end of the Second Replies, Descartes makes the same points, though he makes no mention of incomplete substances:

> "There are various degrees of reality, or being: a substance has more reality than an accident or a mode; an infinite substance has more reality than a finite substance. Hence there is more objective reality in the idea of a substance than in the idea of an accident; and there is more objective reality in the idea of an infinite substance than in the idea of a finite substance"[14].

Critics have objected that Descartes is operating with two different accounts of the dependence/independence distinction here. Kenny remarks that whereas the dependence of finite substances on God is causal, the dependence of modes on substances is logical; modes inhere in substance as subject, whereas created substances are the effects of God as creator. Thus, Kenny claims, "there is no uniform property of independence which things might possess in greater or lesser degree"[15]. It is, then, only by equivocating on the notion of independence that Descartes can treat God, finite substances and modes as points on a common scale. But this is perhaps to see things in too Humean a fashion. It is after all a commonplace that the so-called "Rationalists" tended to assimilate causal to logical relations; as Bennett remarks a propos of Spinoza, "it is not that he sees logical links as weaker than they are; rather, he sees causal links as stronger"[16]. Thus Descartes would probably have been unmoved by the criticism that he is confusing two notions of independence; he would have held that there is just one concept involved which is instantiated in varying degrees by God and finite substances. The assimilation of causal to logical relations is thus central to Descartes's conception of degrees of reality. If Descartes is guilty of a mistake here, it is a mistake of a deep kind; it is no mere surface muddle.

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[11] This agrees with Loeb: *Is There a Problem of Cartesian Interaction? (Reply to Radner)*, in: *Journal of the History of Philosophy* 23 (1985), p. 228. Cf. Kenneth Clatterbaugh: *Descartes's Causal Likeness Principle*, in: *Philosophical Review* 89 (1980), p. 381: "Descartes formulates his causal likeness principle in several ways, all of which are intended to capture the same necessary condition for efficient causality".

[12] *Descartes: The Project of Pure Enquiry*, Hassocks, 1978, p. 143. Other writers (e.g. Radner) speak of the 'at least as much' principle.

[13] Third Replies, AT VII, p. 185, CSM II, p. 130.

[14] *Arguments Drawn up in the Geometrical Fashion*, AT VII, pp. 165–6, CSM II, p. 117.

[15] Kenny, loc. cit., p. 134.

For our purposes, however, it is not essential to decide whether God and finite substances share a single property of independence. As Loeb emphasizes, mind-body interaction takes place within the realm of creatures, and within this realm it is clearly logical independence that is at issue. What is important is whether the independence criterion, as we may call it, is Descartes's sole principle for determining degrees of reality among created beings. Loeb assumes that it is, and this assumption plays a central role in his defense of Cartesian interactionism. For on this criterion the "adequate reality" principle would be violated if and only if "modes of thinking substance cause material substance itself (as distinct from its modes), and modes of material substance cause thinking substance itself (as distinct from its modes)"[17].

In the *Meditations* Descartes does indeed write as if the independence criterion is his sole yardstick. But elsewhere in his writings he seems to have a further criterion up his sleeve. Thus in the Replies to the Second Objections Descartes writes:

> "Thus, when you talk of an 'utterly perfect corporeal being', and take the term "utterly perfect" in its absolute sense, so that a corporeal being is taken to be a being in which all perfections are found, you are uttering a contradiction. The very nature of a body implies many imperfections, such as its divisibility into parts, the fact that each of its parts is different, and so on; for it is self-evident that it is a greater perfection to be undivided than to be divided"[18].

Now, as Loeb recognizes, "perfection" is a synonym for "reality"[19]; in other words, Descartes is saying that minds are more real than bodies. Thus God is more perfect, that is, more real than res extensa not just because he is independent, but also because he is a mind. So we cannot really accept Kenny's remark that "Descartes's scale of being is not the medieval hierarchy of God, angels, men, beasts, plants, matter. It has only three points: infinite substance, finite substance and modes"[20]. It seems that Descartes is more of a traditionalist than Kenny allows, for the principle that mind is more perfect than body goes back at least to Augustine.

Since Descartes has this further, Augustinian criterion of reality, we can see that Loeb's defense of interaction is not adequate as it stands. We can also see why sense-perception rather than the initiation of bodily movements through willing is the real test case for the coherence of Cartesian interactionism. The essence of the problem is easily stated. Sense-perception involves the action of body on mind; in other words, a mental event is produced by a physical cause. According to the "adequate reality" principle, there must be at least as much reality in the cause as in the effect. Yet, on the Augustinian criterion of degrees of reality, the mental is more real than the physical[21]. Thus the danger is that on Descartes's theory of sense-perception, the effect, being mental, will have more reality than the cause – in direct violation of the "adequate reality" principle.

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[16] Jonathan Bennett: *A Study of Spinoza's "Ethics"*, Cambridge: 1984, p. 30.

[17] Loeb: *From Descartes to Hume*, pp. 140–1.

[18] AT VII, p. 138, CSM II, p. 99. There is, however, at least a hint of this second criterion in Meditation VI when Descartes considers the possibility that his sensory ideas are caused by God or "some creature more noble than body (aliqua creatura corpore nobilior)" (AT VII, p. 79, CSM II, p. 55).

[19] Loeb: p. 140.

[20] Kenny: p. 134.

The Application of the "Adequate Reality" Principle to Ideas

The problem of deciding whether Descartes's account of sense-perception honors the "adequate reality" principle is complicated by the fact that he distinguishes two fundamental features of ideas. An idea, for Descartes, possesses both formal and objective reality. An idea has formal reality, inherently, as a state of mind or a mode of a thinking substance. An idea has objective reality by virtue of its representational content: its measure is the amount of formal reality which the object of the idea either possesses or would possess if it existed. Thus, as Descartes explains in the Third Meditation, while all ideas possess the same degree of formal reality, they differ in terms of their degree of objective reality[22]. The idea of God, for instance, possesses vastly more objective reality than the idea of a stone.

This dual character of ideas, formal and objective, makes the application of the "adequate reality" principle rather less than straightforward. Descartes's actual way of applying the principle to ideas has come in for a great deal of criticism[23]. Yet it is not entirely clear just how Descartes does think the principle should be applied. His main statements on the issue are dominated by a single thesis about the objective reality of ideas:

> "In order for a given idea to contain such and such objective reality, it must surely derive it from some cause which contains at least as much formal reality as there is objective reality in the idea". "[T]he objective reality of our ideas needs a cause which contains this reality not merely objectively, but formally or eminently"[24].

And when he proves the existence of the external world in the Sixth Meditation, Descartes sketches the same constraint on the causation of sensory ideas in particular; he claims that the active faculty of producing the ideas of sensible things must exist in a substance which "contains either formally or eminently all the reality which exists objectively in the ideas produced by this faculty"[25]. It is difficult to know how much Descartes is claiming in such passages. His silence on the formal reality of ideas might lead one to suppose that this is not something which he regards as needing a cause; perhaps he thinks that the objective reality is the only aspect of ideas which needs to be explained. Thus he may be giving a complete account of the implications of the "adequate reality" principle for ideas. If so, we get the following principle:

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[21] Radner: *Is There a Problem?*, p. 44, makes reference to Augustine's doctrine that the mind is superior to the body.

[22] AT VII, p. 40, CSM II, pp. 27–8.

[23] Bernard Williams, in particular, has argued that Descartes has no right to say that the idea of x needs as much reality in its cause as x itself would possess formally, for this implies that existing in idea is as real a way of existing as existing formally, – something which Descartes denies, and has reason to deny. (Williams, pp. 140–1). Cf. Margaret D. Wilson: *Descartes*, London, 1978, pp. 137–8. Both Williams and Wilson raise their objections during the course of criticizing Descartes's first proof of the existence of God in the Third Meditation.

[24] Third Meditation, AT VII, p. 41, CSM II, pp. 28–9; Second Replies, AT VII, p. 165, CSM II, p. 116.

[25] AT VII, p. 79, CSM II, p. 55.

(1) The cause of the idea of x must contain as much reality formally or eminently as the idea of x possesses objectively.

On the other hand, Descartes may be doing something more limited. He rightly regards his thesis about the objective reality of ideas as a controversial one, and while insisting on this, he may feel himself able to take it for granted that the formal reality of ideas also requires a cause. If this is so, then a complete statement of the applied principle would be the following:

(2) The cause of the idea of x must contain as much reality formally or eminently as the idea of x possesses both objectively and formally.

It is, I think, most natural to suppose that Descartes's position is best captured by (2)[26]. In other words, the "adequate reality" principle, as Descartes applies it to ideas, is essentially double-barrelled. We shall begin by looking at the barrel which is common to (1) and (2). Let us call this the "objective reality requirement".

At first sight the objective reality requirement is plain sailing for Descartes's theory of sense-perception. Suppose that I am seeing a table. Here I have a sensory idea which has the table for its intentional object. Regarded formally, or in itself, the table is part of the cause of my idea: the table, of course, cannot constitute the whole cause, for according to Descartes's mechanistic picture, such things as light particles and nerve-endings will also play a role. In such a case, then, the objective reality requirement may seem to be straightforwardly honored. There is as much formal reality in the cause as there is objectively in the effect, because my idea of the table is caused by the table itself and other bodies.

Unfortunately, however, the situation is not quite as straightforward as it seems. One of the central themes of Descartes's philosophy is that our sensory ideas, unlike our intellectual ones, are very confused; they are not a reliable guide to the nature of physical reality. Indeed, this mismatch between sense-perceptions and the world is perhaps the most basic of all the morals pointed by the *Meditations*. Thus it may be argued that in their objective aspect sensory ideas contain properties which are not possessed by their causes. The most conspicuous among such properties are of course the secondary qualities. My idea of the table, for example, represents it as having a brown top, whereas in fact there is no color in the table itself.

This lack of correspondence between image and reality certainly complicates the issue, but it is not clear that it poses a real threat to the objective reality requirement. Descartes might perhaps be in trouble if he adhered to the unqualified pre-existence principle. That principle is clearly violated if color exists in my idea but not in the table itself or anything else in the physical world; for then there is something in the effect that does not pre-exist in the cause. But we have seen that Descartes does not in fact hold the pre-existence principle in this unqualified form. On the contrary, what he applies to ideas is the less restrictive principle that there must be at least as much reality in the cause as in the effect.

Some readers might agree that Descartes does not hold the pre-existence principle in this unqualified form, and yet argue that the mismatch between ideas and reality is still an embarrassment. It might be objected that the status of secondary qualities for Descartes poses a threat to the "adequate reality" principle as embodied in the objective reality requirement. If such properties as color have no being outside the mind, then there is a degree of reality in the effect that is not present in the cause; for the object of the idea possesses features that are purely mind-dependent. But, according to the Augustinian criterion, the mental has more reality than the physical, and hence, on Descartes's principles, cannot be caused by it.

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[26] This is the position taken by Williams, p. 140.

Even in this more sophisticated form, such an objection is misguided. In the first place, it seems to involve a category mistake. If secondary qualities are in the mind, then they are ideas, and like all ideas, must possess both formal and objective reality. Considered in terms of their formal reality, ideas of secondary qualities are indeed merely modes of consciousness. Considered in terms of their objective reality, or content, however, they are not mental at all; my sensory idea of brown, for example, is the idea of a property possessed by a physical object. In this respect secondary qualities would be on a par with mythical beings. A unicorn exists only in the mind, but my idea of a unicorn is nonetheless the idea of a physical creature. If secondary qualities are ideas, they are formally mental but objectively physical.

There is also a more straightforward way of replying to the objection. The objection assumes that, for Descartes, secondary qualities are purely mind-dependent, and this assumption is mistaken. In fact, Descartes seems to hold that secondary qualities are genuine properties of bodies, though dispositional und relational ones; he foreshadows the view, developed by Locke, that they are powers in bodies to produce ideas in us. In the *Principles of Philosophy* Descartes comes very close to stating the Lockean thesis:

> "[W]e have every reason to conclude that the properties in external objects to which we apply the terms light, colour, smell, taste, sound, heat and cold – as well as the other tactile qualities and even what are called 'substantial forms' – are, so far as we can see, simply various dispositions in those objects which make them able to set up various kinds of motions in our nerves which are required to produce all the various sensations in our souls"[27].

It is true of course that secondary qualities are not in bodies in the way that common sense takes them to be. The man in the street clearly does not suppose that colors, for example, are merely dispositional properties of objects. This is the truth of the claim that the manifest image is not a reliable guide to the nature of physical reality. Moreover, for Descartes, it is possible in principle to give a complete description of the physical world in terms of primary qualities alone[28]. But it does not follow from this that secondary qualities are merely mind-dependent.

When reality is measured by the Augustinian criterion, the objective reality requirement is in no danger from sensory ideas. And the independence criterion would seem to leave it similarly unscathed. Although formally a mode, my idea of the table is objectively a substance; fortunately its cause is also a substance, so cause and effect are on a par. If one wanted to be uncharitable, one could perhaps press an objection here. For it might be observed that in Descartes's metaphysics there is, strictly speaking, only one res extensa – the entire physical universe. Thus what common sense takes to be substances are in fact more or less arbitrarily selected fragments of a much larger whole. By contrast, when we consider the idea of the table from an objective viewpoint, we must regard it as a substance; for we take the table to be a substance just as surely as we take it to be brown. Indeed, it might be said that consistency requires this; for we have earlier claimed that the revisionary nature of Descartes's metaphysics leaves the objective reality of ideas unaffected.

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[27] AT VIII A, pp. 322–3, CSM I, p. 285. For Locke's views on secondary qualities, see *Essay Concerning Human Understanding*, II. 8.

[28] Cf. Williams, p. 243.

Such an objection does indeed seem uncharitable, and there are several ways in which it could be met. In the first place, Descartes could reply that he is still prepared to recognize tables and chairs as substances; certainly in the Third Meditation he does not quarrel with the claim that a stone is a substance[29]. But secondly, and more cogently, Descartes can draw on his scientific world picture; he can reply that the table is nothing like the total cause of a sensory idea, even in its objective aspect. On the contrary, it is one element in a mechanistic process which also involves, for example, the movement of light-particles and the stimulation of nerve-endings. Descartes might not wish to hold that every part of the physical universe is causally involved in my seeing a table; but he could surely say that the physical process is so extensive that there is a sense in which res extensa is the cause[30]. In other words, my seeing the table is caused by a substance. There is thus no violation of the objective reality requirement.

A more radical route to the same conclusion has been suggested by Margaret Wilson in another context. Drawing on the discussion of material falsity in the Third Meditation, Wilson suggests that Descartes regards sensory ideas as "mere nothings" from the objective point of view[31]. Clearly, if this is correct, it disposes of the problem at a stroke. For if ideas of sense have no objective reality, there can be no danger that the effect will have more reality than the cause. Wilson's interpretation, however, seems to me textually unfounded; for one thing, it seems to depend on an illicit assimilation of sensory ideas in general to materially false ideas. But Descartes surely holds that while all sensory ideas are confused, only those which are privative (like cold) are materially false[32]. In any case, Wilson's suggestion that, in terms of objective reality, sensations are "mere nothings" seems contradicted in the Sixth Meditation. After claiming that he cannot be the cause of his sensory ideas, Descartes observes:

> "The only alternative is that [this active faculty of producing or bringing about ideas] is in a substance distinct from me – a substance which contains either formally or eminently all the reality which exists objectively in the ideas produced by this faculty"[33].

Surely it is presupposed here that sensory ideas do contain objective reality; they are not "mere nothings". Thus Wilson's interpretation must be rejected. Fortunately, it is not necessary for our purposes.

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[29] AT VII, p. 44, CSM II, p. 30.

[30] M. Gueroult claims that the objective reality of sensory ideas is caused by the modes of bodies, but he does not argue for this claim. Gueroult: *Descartes selon l'Ordre des Raisons*, vol. 2, Paris 1968, p. 91.

[31] Wilson, loc. cit., p. 111. On p. 114 Wilson seems to qualify her original statement; she claims only that Descartes implies that "most ideas of sense may lack objective reality (excluding extension, figure, motion and situation, which are supposed to be ideas of intellect as well)". (Emphasis added). Cf. Gueroult: vol. 1, p. 218.

[32] Third Meditation, AT VII, p. 44, CSM II, p. 30. I do not wish to endorse Wilson's statement that even materially false (i. e. privative) ideas must lack objective reality for Descartes. As Wilson herself recognizes this implication would be an embarrassment for Descartes. Cf. my discussion of pain sensations below.

[33] AT VII, p. 79, CSM II, p. 55.

So far, then, we have shown that Descartes's theory of sense-perception honors the objective reality requirement:

(1) The cause of the idea of x must contain as much reality formally or eminently as the idea of x possesses objectively.

As we have seen, (2) includes a further requirement: the cause of the idea of x must contain as much reality, formally or eminently, as the idea of x contains not only objectively but also formally. Does the additional requirement – let us call it "the formal reality requirement" – sabotage any defense of Descartes's theory of sense-perception?

When we move to the formal reality requirement, we touch upon traditional worries about Cartesian interactionism. We can no longer avoid the ontological divide that separates ideas from physical objects. In its formal aspect an idea is a mode of a thinking substance; but on the interactionist model its cause is purely physical. On the Augustinian measure of degrees of reality, the mental is more perfect, and hence more real, than the physical. So it would seem that Descartes cannot satisfy the formal reality requirement unless he abandons the Augustinian criterion. Something, it would seem, has got to give.

Something has got to give, but less than one might think. Descartes need not give up the Augustinian criterion altogether; all he need do is subordinate it to the independence criterion. Descartes can say that the Augustinian criterion is a subsidiary principle of ordering within the categories of substance and mode. In other words, within the category of substance, a mind is more real than a body; similarly, within the category of modes, an idea is more real than, for example, the shape of a physical object (taking this to be a mode of an extended substance). Thus any substance qua substance ranks higher than any mode, even a mode of thought. If Descartes adopts this option, then the threat of inconsistency disappears. For when I am seeing a table, a mode of thought is being caused by res extensa. Since even an extended substance is more real than a mode of thought, there is no violation of the formal reality requirement.

It is, I believe, reasonable to assume that the independence criterion takes precedence in Descartes's system. For in the *Meditations* it is the independence criterion which Descartes chooses to parade, and this is surely evidence of his sense of priorities. Indeed, the Augustinian criterion finds explicit expression only in the Replies to Objections. It might be inferred from this that the Augustinian criterion is more a polemical, ad hominem tool than an essential ingredient of Descartes's system. But even if this is disputed, and the proposed ordering still seems ad hoc, there is still a way in which Descartes can effectively counter the accusation of inconsistency. In other words, the coherence of Cartesian interactionism can be defended even if Descartes is committed to holding that nothing mental, in its formal aspect, can be caused by a physical substance.

We have seen earlier that when Descartes discusses the causation of sense-ideas, he focuses all his attention on their objective reality. Now we need not take this as implying that only the objective reality of ideas stands in need of a cause; since in its formal aspect, an idea is something real, it seems unlikely that Descartes would say this. But Descartes's approach to the topic does prompt one to wonder whether the formal and objective aspects of ideas must have the same cause; in other words, perhaps Descartes's view is that, while in their objective aspects, sensory ideas are caused by bodies, in their formal aspects, as modes of a thinking substance, they are caused by something else.

Support for the suggestion that the formal and objective aspects of ideas are separately caused comes from one of Descartes's key metaphors. Perhaps surprisingly in view of his commitment to innate ideas, Descartes is prepared to compare the mind to wax which can take on various shapes. In a letter to Mesland Descartes is very explicit on this point:

> "I regard the difference between the soul and its ideas as the same as that between a piece of wax and the various shapes it can take. Just as it is not an activity but a passivity in the wax, to take various shapes, so, it seems to me, it is a passivity in the soul to receive one or other idea, and only its volitions are activities"[34].

If we follow through this metaphor, we get a certain picture of the role of physical objects in sense-perception. Bodies are causally responsible for the objective reality of our ideas: they determine, as it were, the nature of the shapes the wax receives. But though they cause the mind to be modified in a particular way, they do not bring it about that there is something mental to be modified. In terms of Descartes's own metaphor, the seal or whatever it is that causes the shapes does not explain the presence or the persistence of the wax. In other words, bodies are causally responsible for the objective, but not the formal, reality of ideas.

Descartes's wax metaphor, then, strongly suggests that there is a division of labor in the causation of sensory ideas. If the role of bodies is limited in this way, what is it that accounts for the formal reality of ideas? For the purposes of defending interactionism, it is not strictly necessary to answer this question; it would be enough to establish that there is a division of labor, and that the role of bodies extends only to the objective reality of our sense ideas. But we can, I think, suggest a possible answer. Recall that in the Third Meditation Descartes proposes his continuous creation doctrine. According to this doctrine, finite substances have no inherent tendency to persist in existence; on the contrary, they depend causally at every moment on the power of God who conserves the universe by continuously re-creating it[35]. Thus God, for Descartes, not only creates minds in the first place; he is also at least a causally necessary condition of their continued existence. So if Descartes wishes to explain why there is something mental, capable of receiving determinate modifications, it seems he must appeal to God. If this is the case, then the formal reality requirement is honored as handsomely as possible; for God has infinite formal reality.

Pain Sensations

So far we have focused exclusively on the causality of sense-perceptions. But of course not all the mental events which are caused by bodies are of this type. Indeed, when one considers the action of body on mind, what one may think of first is not sense-perception but such things as pain sensations. The pain caused by the dentist's drill is certainly a more striking case of body-mind interaction than my visual experiences caused by the table in front of me. Thus a defense of the coherence of Cartesian interactionism requires at least some account of pain sensations.

Not surprisingly, then, pain sensations tend to be prominent in discussions of Cartesian dualism. Curiously, however, Descartes's treatment of the status of such sensations is rather obscure. It is clear, of course, that like sense-perceptions, pain sensations are confused modes of thinking which arise from the union of mind and body: indeed, there is much in Descartes's philosophy that drives him to assimilate sense-perceptions and pain sensations. What is not clear is how far and in what way Descartes wishes to draw a distinction between the two. Unlike sense-perceptions, pain sensations are not, strictly speaking, ideas. All ideas, for Descartes, are thoughts or modes of consciousness, but not all thoughts or modes of consciousness are ideas in the strict sense:

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[34] 2 May 1644 (?), AT IV, p. 113 f, K, p. 148. Contrast Leibniz: *New Essays On Human Understanding*, II. 1.

[35] AT VII, p. 49, CSM II, p. 33.

> "Some of my thoughts (cogitationes) are as it were the images of things (tanquam rerum imagines), and it is only in these cases that the term 'idea' is strictly appropriate; for example, when I think of a man, or a chimera, or the sky, or an angel, or God"[36].

The problem is to decide just what Descartes is committed to by his denial that all cogitationes are ideas in the strict sense. In particular, does he mean to deny that pains have objective reality? If this were Descartes's view, then we would have to give up our earlier suggestion that bodies play no causal role in the case of formal reality, for pain sensations are said to arise from the mind's union with the body[37]. But it is difficult to see how Descartes could reasonably hold that there are cogitationes without content. Unless cogitationes have content by their very nature, he cannot explain the phenomenological difference not merely between pains and visual experiences but between various types of pain. When we distinguish a dull ache from a sharp, stabbing pain, we are surely talking about a difference in the objects or representational content of the two experiences. Indeed, two pain sensations can be distinguished from the objective point of view even when the same part of the body is affected. Thus it is hard to see how a modification of the mind could possess merely formal reality[38].

Fortunately, there is no need to suppose that Descartes denies that pains have objective reality. What he seems to deny is that all cogitationes are "as it were, pictures of things (tanquam rerum imagines)": only those which meet this standard are, strictly speaking, ideas. Most writers concentrate on the first part of this requirement: ideas are in some sense like pictures. But the second part of the requirement is also significant: what Descartes seems to be saying here is that, strictly speaking, only those thoughts are ideas which have thing-like objects, and this interpretation is confirmed by Descartes's list of examples. Such a claim in no way implies that only ideas have objective reality: it leaves open the possibility that other cogitationes may have objects or representational content of a different kind[39].

If this is correct, then we can see how Descartes would apply the "adequate reality" principle to pain sensations. Pain sensations by their nature have objects, but these objects are not thing-like; rather, they are more like properties or modifications. A pain, then, will be a "thought" which typically represents a modification in a certain part of the body. As we have seen earlier, Descartes will of course criticize the view that there is really anything in my foot similar to my pain; but as we have also seen, this does not affect the objective reality of the sensation. Since pains are not, objectively speaking, thing-like or substantial, we can see that they are easily covered by the objective reality requirement. In its objective aspect, the pain is a mode, but its cause is a substance, namely res extensa. And in its formal aspect, it is covered by our earlier discussion of sense-perception.

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[36] AT VII, p. 37, CSM II, p. 25.

[37] AT VII, p. 81, CSM II, p. 56.

[38] Cf. Gueroult: vol. 1, p. 218.

[39] Unlike Wilson (p. 102), I do not believe that Descartes means to imply that all thoughts have an element that is "like the image of a thing".

Conclusion

We have seen that, as applied to ideas, the "adequate reality" principle consists of two requirements. I have sought to show that Descartes is in no danger of violating either. The most that has been conceded is that, to meet the second requirement, he might be tempted to weaken his interactionist thesis: he might choose to say that the formal reality of ideas is caused, not by bodies, but by God. Even this is not a position that is forced upon Descartes, for he has the option of playing down his Augustinian criterion. But if Descartes does choose to resort to God, his theory is still in an important sense interactionist; for bodies are causally responsible for the objective reality of ideas. There is no danger that Descartes's thesis will simply collapse into occasionalism.

In this paper I have sought to defend the internal coherence of Cartesian interactionism. I have not of course tried to defend the "adequate reality" principle itself, or even Descartes's way of applying it to ideas[40]. My concern with the internal coherence of Descartes's position also explains the exclusive focus on the one direction of interaction. On Cartesian principles there can be no problem posed by the causation of physical changes by willing; for here the Augustinian principle works to Descartes's advantage. Modern philosophers may find Descartes's account of voluntary movements mysterious, but they do so for reasons that are quite external to his system.

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[40] Critics have generally objected that Descartes's way of applying the "adequate reality" principle to ideas imposes too strong a requirement. In particular, the objective reality requirement (or Descartes's interpretation of it) has been criticized. (See note 23 above). Thus even if the "adequate reality" principle is applied in some other, more defensible way, it will pose no problem for mind-body interaction.

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PHILOSOPHICAL TOPICS
VOL. 19 NO. 1, SPRING 1991

Descartes on the Origin of Sensation

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Descartes holds that it is "the mind that senses, not the body,"[1] but he clearly believes that certain motions in the brain play a crucial role in all episodes of sense perception. Most readers of Descartes, from the seventeenth century to the present, have taken the role in question to be that of efficient causality: states of the brain are supposed to *produce* sensations in the mind. Beginning with Descartes's contemporaries, however, many critics have objected that there is something peculiarly suspect, unintelligible, or even inconsistent in the notion that an extended unthinking thing (body) interacts causally with an unextended thinking thing (mind or soul). Often the objection to body-mind interaction takes the form of a straightforward claim that interaction between substances of such "different natures" is inconceivable and impossible: Robert Richardson has dubbed this claim the "heterogeneity objection."[2] Sometimes the critic focuses on issues of internal consistency: alleging, for instance, that body-mind causation violates restrictions on causality espoused by Descartes himself.[3] It is not even uncommon to find writers attributing to *Descartes* the view that mind-body interaction is peculiarly problematic, or even "impossible".[4] A few have held that Descartes in fact did not mean to maintain that states of the brain actually cause sensations in the mind.[5] Recently, however, several scholars have impressively defended the claims that (a) Descartes does think of the relation as one of efficient causality; (b) he forthrightly rejects the notion that there is anything particularly problematic about body-mind interaction; and (c) he has not been shown wrong on this point.[6]

Recent apologists have made important contributions to our understanding of Descartes; I find their positions persuasive, up to a point. It seems to me, though, that both Descartes's critics and his defenders have oversimplified the problem of attributing to him a coherent and univocal position on the role of bodily states in the origin of sensation. In this essay, I want, first, to assess and reinforce the progress that has recently been made in understanding Cartesian interactionism with respect specifically to the origin of sensation; and, second, to call attention to complexities, difficulties, and apparent contradictions that remain to be confronted in the Cartesian position.[7]

To appraise the problem accurately, it is necessary to consider a much wider range of Cartesian texts than one usually finds cited in this connection. Also, one needs often to take note of the original language terms. I begin by providing, in the first section, an overview of representative passages concerned with sensation, from both the scientific and philosophical writings. In the second section, I draw on these and other passages to evaluate some prominent interpretations and criticisms, with particular emphasis on the merits of recent defenses of the coherence and consistency of Descartes's position. In the remaining sections, I focus on problematic aspects of Descartes's statements about sensation that have not been adequately addressed by his defenders.

In section three, I discuss an apparent conflict in Descartes's statements about where ideas of sense "come from" and a related problem about the alleged "passivity" of the mind in sensation. Although I suggest some ways to mitigate the problems, I think that the texts may be genuinely inconsistent. (That is, the difficulties spring from a real conflict between ways in which Descartes thinks about the origin of sensory ideas in different contexts, rather than superficial incongruities.)

In the fourth section, I document the prominence in Descartes's work of the notion that the brain-mind relation in sensation involves the brain "presenting" something (a pattern of motions) to the mind. This conception, besides being intrinsically bizarre, is evidently at odds with other familiar Cartesian doctrine. I argue that attempts to dismiss it as merely metaphorical are inconclusive.

In section five I briefly discuss the more nearly associationist picture of the brain-mind relation presented in other passages. I agree with some recent apologists at least to the extent of regarding this as Descartes's *best* account of the body-mind relation in sensation, though I cannot accept the view that it is his *standard* account. In section six, I argue, however, that efforts to interpret this account through respected modern positions about causality aren't fully borne out by the texts—and involve some conceptual loose ends as well.

I

How, then, does Descartes describe the relation between bodily state and mental "idea" in sensation? Often he says simply that motions in the brain (following upon motions in the sensory nerves) "excite" (*excitare*) or "bring about" (*inferre*) sensory ideas or sensations of pain, warmth, color, sound, etc. in the mind; or "affect" (*afficere*) or "act on" (*agir contre*) the mind so that sensations "follow" in it; or "make" (*faire*) the mind sense or perceive; or "stimulate" (*impellere*) it to have sensations. The following passages are representative:

> But the motions which are thus excited in the brain by the nerves affect (*afficiunt*) the soul or mind, which is intimately conjoined with the brain, in different ways, according to their own diversity. And the different affections of our mind, or thoughts, immediately following upon (*consequentes*) these motions, are called perceptions of the senses, or in common speech, sensations. (PP IV. 189: AT VIII–1, 316; CSM I, 280.)[8]

> . . . such is the nature of our mind that from the fact alone that certain motions occur in the body, it can be stimulated (*possit impelli*) to have all sorts of thoughts, carrying no image of these motions . . . ; and especially those confused thoughts called sensings or sensations (*sensus, sive sensationes*). (PP IV, 197: AT VIII-1, 320; CSM I, 284)

> . . . if this motion [in the nerve filaments] is augmented or diminished by some unusual cause, its augmentation will make (*fera*) the soul have the sensation of heat, its diminution, the sensation of cold. And finally, according to the different other ways in which they are moved, they will make [the soul] sense all the other qualities which belong to touch in general, such as *humidity, dryness, weight,* and the like. (TM: AT XI, 144–45; H 39–40)

> . . . any one of the motions which are in that part of the brain which immediately affects (*afficit*) the mind brings about (*infert*) one particular sensation in it . . . (Med VI: AT VII, 87; CSM II, 60)

It is notable that in these and many similar passages in which Descartes alludes to the body-mind relation in sensation he uses terms other than French or Latin cognates of the word 'cause'. This fact might seem to lend credence to the position of those who deny that Descartes did think of the relation as a "causal" one. Yet the terms he does commonly use—such as *faire, afficere,* and *inferre*—surely carry causal connotations. In the *Meditations,* he uses *producendi* and *efficiendi* in the context of an argument for the material origin of sensory ideas (AT VII, 79; CSM II, 55). And in fact the term *causer* is itself used occasionally: for instance, in a passage from the *Meteors* and in a letter to Elizabeth.[9]

But the complexity of Descartes's comments on the body-mind relation in sensation goes beyond the terminological diversity so far surveyed. Frequently, for example, Descartes indicates that the effects that brain motions have on the mind depend on connections "instituted by nature" (or by God):

> it is the motions [in the brain] . . . which, acting immediately on (*agissans contre*) our soul in as much as it is united to our body, are instituted by Nature to make it have such sensations (*luy fait avoir de tels sentiments*). (Diop VI: AT VI, 130; CSM I, 167)[10]

A conception of the body-mind relation as a "sign" relation is often introduced in conjunction with this notion of "natural institution":

> But if words, which signify nothing except by the institution of men, are sufficient to make us conceive of things which they have no resemblance, why is Nature not able to have also established a certain sign which makes us have the sensation of light (*qui nous fasse avoir le sentiment de la Lumiere*), even though this sign has no feature which is similar to that sensation. (TL I: AT XI, 4; CSM I, 81)

Descartes uses the word or sign analogy to help establish the point, essential to his mechanistic approach to physical phenomena, that the state of the brain that leads up to perceptual experience need not "resemble" the perceptual experience itself: for instance, our experiences of colors do not follow on the instantiation in the brain of colors as we experience them, and even experiences of particular shapes are not generally traceable to an instantiation in the brain of *those particular* shapes.[11] When developing this vein of thought, Descartes may stress that it is an entirely arbitrary matter which brain state is connected with which sensory idea:

> Of course the nature of man could have been so constituted by God that the same motion in the brain [as in fact gives rise to the sensation of pain in the foot] would exhibit something else to the mind: namely, either itself [i.e. the motion], in so far as it is in the brain, or in so far as it is in the foot, or in some intermediate location, or finally anything else at all . . . (Med VI: AT VII, 88; CSM II, 60–61)[12]

Sometimes the sign the brain gives the soul is said to "make" the soul have a certain sensation, as in the passage quoted just above from the *Treatise on Light.* Rather often, though, Descartes speaks of the brain motions as "giving occasion to" the mind "to form" or "to conceive" ideas of sense:

> For [in hearing] it will be these little blows [of air against the ear membrane] which, passing to the brain through the intermediation of these nerves, will give occasion to the soul to conceive the idea of sound (*donneront occasion a l'ame de concevoir l'idée des sons*). (TM: AT XI, 149; H 46)[13]

> . . . not because these things [outside us] transmitted the ideas themselves to our mind through the organs of sense, but rather because they transmitted something which gave [the mind] occasion to form them (*ei dedit occasionem ad ipsas . . . efformandas*), through a faculty innate to itself, at this time rather than another. (NiP: AT VIII–2, 359; CSM I, 304)[14]

He also sometimes speaks of the transaction between brain and mind that occurs when we sense in terms of the mind "considering" images (or *corporeal* ideas) in the brain:

> . . . it is only those [figures] traced . . . on the surface of gland *H*, where the seat of imagination, and of the common sense is, that should be taken to be ideas, that is to say, to be the forms or images that the rational soul will consider immediately when, being united to this machine, it will imagine or will sense any object. (TM: AT XI, 176–77; H 86)[15]

Elsewhere he speaks of the mind as having sensations "impressed" or "imprinted" on it by brain movements.[16] He also sometimes says (in apparent contradiction with a passage just quoted from the *Comments*) that ideas of corporeal things are "transmitted to" or "come to" the mind from the physical world, from bodies.[17]

II

I have already pointed out that many of the terms which figure prominently in Descartes's accounts of the brain state-sensation relation—including cognates of 'cause' itself—are hardly compatible with the thesis that Descartes did not think of the relation as *causal.* Further, though, even the passages that are most often taken to support this thesis—those which say that the brain "gives a sign" to the mind or gives the mind "occasion to form" a sensation—do not clearly count against a causal interpretation, for "giving A occasion to F" or "giving a sign to A to F" are not antithetical to "having an effect on A;" Indeed, it's hard to see how something could give a sign to A without in some way having an effect on A or causing some change of state in A.[18] (As I will explain below, these locutions do raise a question about whether Descartes consistently holds that the mind *passively receives* its ideas of sense *from outside;* but this is a different issue.) In any case, it is very far from clear that trying to substitute "occasion" or "sign" accounts of the relation of the brain to mind in sensation for the postulation of causal efficacy will bring about a net improvement in intelligibility. If it's hard to understand how the brain can cause ideas in the mind, it's at least equally hard to understand how the brain can, non-causally, "give the mind signs."[19]

Much more promising are the several recent attempts to meet the heterogeneity objection head-on by denying that it constitutes a genuine problem: in Descartes's mind, or as an inadvertent internal problem for his system, or with respect to what is philosophically tenable. Of particular importance to this position is Descartes's own emphatic statement that critics who advance the heterogeneity objection are just confused. The key statement occurs in a letter to Clerselier, originally published with the French version of the *Replies to Objections.* (The letter concerns a summary of Gassendian objections which had been submitted to Descartes.) Descartes writes:

> As for the two questions added at the end, namely: *how the soul moves the body, if it is not at all material? & how it can receive the species of corporeal objects?* . . . I will tell you privately, that all the difficulty they contain only proceeds from a supposition which is false, and which cannot at all be proved, namely, that if the soul and the body are two substances of different nature, that prevents them from being able to act the one upon (*contre*) the other. . . . (AT IX–1, 213; CSM II, 275)[20]

It does seem that this clear rebuttal puts the burden of proof on those who want to make the heterogeneity objection stick. I also think that the recent repudiators of the objection are quite right in claiming that critics of Descartes—from Elizabeth, Gassendi, Simon Foucher, and Leibniz to the present—have failed to make clear why exactly "heterogeneity" is supposed to preclude interaction.[21] As some of the recent defenders have observed, critics of Descartes's position may be assuming that "intelligible" causal relations are just those that conform to mechanistic "impact" models, but twentieth-century critics, at least, should know better than to make such an assumption.[22] And they have rightly remarked that Descartes himself sometimes seems to indicate that body-mind causation is none the worse for not being a case of causation by impact.[23]

Besides making these general points, recent defenders of Descartes have discussed aspects of the body-mind interaction issue in some detail. One question which has received considerable attention in the apologetic as well as the critical literature is how Descartes's "causal principles" bear on the postulation of body-mind causation. I basically agree with the apologists that we have yet to see demonstrated any insurmountable inconsistency in principle between Descartes's restrictions on causality and the assumption of body-mind interaction. I want to review the issue briefly, however, for only when one sees why the causal restrictions do *not* in principle rule out body-mind causation is one in a position to understand where the consistency problems in Descartes's position *really* lie.

There can be no doubt that Descartes sometimes endorses conceptual restrictions on what can be supposed to cause what. Such restrictions figure prominently in his "causal" arguments for the existence of God in Meditation III and the proof of the existence of body in Meditation VI. There has been a great deal of controversy, however, over precisely what causal restrictions Descartes wishes to propound.[24] Disagreements over whether his "causal principles" create problems for the postulation of body-mind causation to a large extent hinge on the identification of these principles. Those who see a consistency problem of this nature tend to ascribe to Descartes a principle that the cause must be "like" the effect.[25] Others argue that Descartes holds only that the cause must contain "at least as much reality as" the effect. They point out that *this* principle seems to present no problem for body-mind causation.[26] Descartes's rankings of things by "degrees of reality" are not complex, they basically reduce to the two assertions that infinite substances have more reality than finite substances, and finite substances have more reality than modes. Hence what the "reality" principle rules out is just that a mode could "cause" a substance, or a finite substance an infinite one. Some commentators, however, find in Descartes's works a further restriction on causation—distinct from a "likeness" principle"—that renders body-mind causation at least prima facie problematic: namely the principle that the (total efficient) cause must *contain the effect,* formally or eminently.[27]

Descartes's defenders have adequately established both that there is no basis for ascribing to him a "causal likeness" principle and that the "degrees of reality" principle is consistent with body-mind causation on his three-tiered ranking of "reality".[28] It is true, though, that Descartes also claims that the cause must "contain the effect, formally or eminently."[29] (He stresses in response to objections that he means the "efficient and total cause.")[30] And there is reason to suggest that this principle does present a problem for the postulation of body-mind causality which does not emerge from the "degrees of reality" constraint alone.

Basically the difficulty is this. Body clearly does not contain mental modes ("thoughts") "formally" for to contain a state formally is literally to have that state—as when a moving body causes motion in another body or the sun causes heat in a stone.[31] (And surely anything that has a thought in this sense *is a mind.*) But it does not seem that body can contain mental modes "eminently" either, for Descartes holds that eminent containment requires that the cause contain "more excellent perfections" than those found in the effect or that it be "more noble" than what can contain the perfections of the effect.[32] (So God contains bodies eminently.) It seems highly implausible to ascribe to him the view that body contains "perfections more excellent than" mental modes; and he explicitly says that the human mind is "much nobler than" the body.[33] So (it would seem to follow) the causal containment principle rules out body-mind causation.

There are two, mutually compatible, ways of replying to this objection. In order to explain them, it will be helpful first to take note of Descartes's distinction between two senses of 'idea' in the *Meditations'* "Preface to the Reader" (AT VII, 8; CSM II, 7). By 'idea', he says, one can mean either an "operation of the understanding" or "the thing represented by this operation." In Meditation III, Descartes remarks that *he* (as mind) is the source of all his ideas in the first sense: if his ideas are considered simply as modes of thought, disregarding their different representative contents, they "all seem to proceed from me (*a me procedere*) in the same manner" (*AT* VII, 40; *CSM* II, 27–28); each of them is a "work of the mind" (*AT* IX, 32 (*FV*).[34] Presumably such locutions imply that the mind at least contributes to the efficient causality of its ideas, viewed in one way. Bodily modes might then be admitted as *partial* causes of ideas (considered in this way) without being required, under the containment principle, to contain the ideas caused. (The containment principle applies only to *total* causes, and could be satisfied in the case envisaged as long as the cause constituted of mind plus bodily states may be said to "contain" ideas formally or eminently.)[35]

Secondly, and perhaps less tenuously, it appears that body is a perfectly legitimate candidate under the containment principle to serve as cause of ideas considered in the second sense—in other words, as what is represented in the mind.[36] According to Descartes's conclusion about the existence of bodies in Meditation VI, all the properties that I "clearly and distinctly understand" in bodies are formally contained in actual bodies (*AT* VII, 83; *CSM* II, 57). He further explains that these properties are all those which, generally considered, are comprehended in the object of pure mathematics. This "object" has previously been characterized (at the beginning of Meditation V) as continuous quantity in which are numbered various parts with their respective sizes, shapes, positions, and motions. It seems, then, that body is eligible to cause the representation in the mind of these qualities while satisfying the constraint of *formal* containment. It further seems quite plausible to suppose that Descartes might think the contents (such as they are) of mere sensations or confused ideas of sense—such as color, taste, etc., which on his principles fail to "exhibit" any properties formally contained in body—are *eminently* contained in body, for after all he has said in Meditation III that such ideas "exhibit so little reality," he can hardly distinguish it from non-being (AT VII, 44; CSM II, 30). Although his conclusion there was that he himself (as mind) could be their cause, it seems that by parity of reasoning he could just as well conclude that virtually *anything* with "perfections" could be their cause under the condition of eminent containment.[37]

For these reasons, I believe that Descartes's apologists are correct in denying that even the "containment" restriction on causality is straightforwardly inconsistent with body-mind causation.[38] Now, however, we are in a position to see that Descartes's treatments of the causation of sensory ideas do present other problems of consistency and coherence. In the next section, I will try to establish this point with respect to two closely related questions. First, does Descartes wish to maintain that sensory ideas of bodies (considered as representative contents) actually are caused in the mind by bodies in which they are antecendently contained? Second, is the fact that we do not voluntarily produce the sensory contents in our mind sufficient to establish that we are merely passive recipients of them?

III

The source of our sensory ideas of bodies is the ostensible focus of the proof of the existence of body in Meditation VI. Descartes notes that he has a "certain passive faculty of sensing, or of receiving and recognizing the ideas of sensible things" and that this faculty would be useless unless there were also, in himself or something else, an active faculty "for producing or bringing about these ideas" (AT VII, 79; CSM II, 55). He first eliminates himself as the cause of such ideas (considered as *representing* physical things) on the grounds that they are produced in him "without my cooperation, and even also against my will (*invito*)." He then concludes that such ideas *are sent forth from* corporeal things (*a rebus corporeis emitti*), on the grounds that he has a strong disposition to believe that they are sent forth from bodies, so any other hypothesis about their origin would entail that God is a deceiver (AT VII, 79–80; CSM II, 55). Similarly, in *Principles* II.1, he holds that such ideas come from *advenire*, that they are "exhibited to" us by corporeal objects—or by "extended matter"—on the grounds that it is not in our power to bring about particular sensations.[39] So far it looks as if Descartes thinks that bodies cause sensory contents in us by sending them into our minds; and it looks as if he holds that bodies are able to do this in virtue of actually exemplifying the very qualities represented in the ideas—at least with respect to perceptions of shapes, sizes, positions, and motions.

I will now try to show, first, that close inspection of both the *Meditations* and the *Principles* passages reveals a tendency of thought contrary to this conception of the production of sensory ideas; and, second, that other texts—especially *Comments on a Broadsheet*—appear flatly to contradict it.

We have seen that Descartes begins by talking about *sensory* ideas of bodies in both the *Meditations* and *Principles* arguments for the existence of matter: it is these which come to him "without my cooperation" (Meditation VI), which "are not in our power" (PP II.1). He does *not* conclude, though, that the specific, determinate qualities represented by particular sensory ideas are exemplified in particular external physical objects which actually cause the ideas: not even specific sizes, shapes, and motions. It is the idea of *matter in general* which, according to both passages, we must suppose to have "formal" existence outside the mind if we are to avoid the conclusion that God is a deceiver. According to the *Principles,* "we sense, or rather stimulated by sense we clearly and distinctly perceive" this matter. According to the *Meditations,* we can ultimately conclude only that corporeal things possess all the properties which *considered generally* are, in *res extensa,* considered as mathematical objects. He specifically goes on to indicate that such "particular aspects" of body as that the sun is of such and such a size or shape, as well as obscure ideas of light or sound or pain, do not fall within the scope of this argument. What he actually seems to be saying, then, is that (a) sensory ideas are "produced" by matter; that (b) matter formally possesses, in some *general* sense, those mathematical properties that are clearly and distinctly apprehended; but (c) not even the size, shape, and motion represented in a particular sensory idea need be actually exemplified in a particular external body that constitutes the cause of the idea.[40]

A later work, *Comments on a Broadsheet*, not only draws back from but directly repudiates the notion—suggested by much of the *Meditations* passage especially—that ideas of external qualities are simply received into the mind from particular external bodies which exemplify them. As already mentioned, Descartes there holds that external things transmit to our mind, through the organs of sense, something which "gives [the mind] occasion to form [the ideas]." In this work, he also says that "we form in [or by] thought" the ideas of external things when bodily motions provide the occasion to the mind; and that, on the occasion of appropriate motions in the brain, the mind "exhibits to itself" ideas of pain, color, sound, and the like.[41] To some extent this language accords with the view, discussed above, that the mind itself is the cause of its ideas considered as modes of thought, as "operations of the understanding"; but Descartes here goes much further. He holds also that sensory ideas *as contents* are innate in, or within the productive power of, our "faculty of thought":

> . . . there is *nothing in our ideas,* which is not innate in the mind, or the faculty of thought, except for those circumstances, which have regard to experience: i.e., that we judge that these or those ideas, which we now have present to our thought, are to be attributed to certain things outside us: not because these things transmit (*immiserunt*) the ideas themselves to our minds through the organs of sense, but because they nevertheless transmit something, which gives the mind occasion to form the ideas, by a faculty innate in it, at this time rather than another. (AT VIII–2, 358–9; CSM I, 304, emphasis added)[42]

On this picture the division of labor between brain and mind seems to be as follows: a motion in the brain "excites" the mind to "form" as an actual conscious state a sensation which previously existed in it, but only potentially, or as a capacity of thought.

Cartesian texts, then, fail to give a single consistent answer to the question whether ideas considered as sensory contents have their origin in bodies—even when the favored "mathematical" qualities are at issue. Further, the reason Descartes offers when he advances a negative answer to this question is not at all bound up with the containment restriction or any other general causal principle.

When, in the *Comments,* Descartes claims that sensory ideas are innate and that the mind simply "exhibits them to itself" under appropriate stimulation, he grounds these claims on the mechanistic account of sensation he has previously presented in the *Dioptrics* and *Principles.*[43] He writes:

> . . . whoever correctly observes how far our senses extend, and what it is precisely that can come (*pervenire*) from them to our faculty of thought, must admit that in no case do they exhibit to us the ideas of things, such as we form them in thought. So much so that there is nothing in our ideas, that is not innate in the mind, or faculty of thinking, except only those circumstances which have regard to experience . . . (AT VIII–2, 358; CSM I, 304)

That the sensory ideas we have of bodies cannot come from bodies through the senses, or be "exhibited" by our physical sensory system to our mind, is evident, Descartes here holds, from the facts about the perceptual process established in his earlier works. All that "approaches (*accedit*) our mind from external things through the sense organs" are certain corporeal motions; and even these, "and the figures which arise from them [in the nerves], are not conceived by us such as they occur in the organs of sense." It follows from all this, Descartes concludes,

> . . . that the ideas of the motions and figures are themselves innate in us. So much the more must the ideas of pain, color, sound and the like be innate, that our mind may, on occasion of certain corporeal motions, exhibit them to itself; for they have no likeness (*similtudinem*) to the corporeal motions. (AT VIII–2, 359; CSM I, 304)

The position presented here clearly rests on the assumption that the lack of "likeness" between ideas of sense and actual brain states is sufficient to establish that the former must "come from" the mind. Descartes seems to be assuming, that is, that ideas in the mind could "come from" the brain only if the brain movements provided the mind with *exact models or images* for what is represented in idea. Because they present to the mind much less than that, they must be regarded only as "occasions" of the mind's representational activity. *This* is the reason for Descartes's claim that the senses, rather than transmitting ideas of corporeal things to the mind, merely "transmit something which . . . gives the mind occasion to form these ideas, by a faculty innate in it."[44]

Note that the lack of "likeness" between idea and brain state with which Descartes is here concerned is different from that at issue in the heterogeneity objection. The issue here is not heterogeneity of mental *qua* mental from physical *qua* physical, otherwise Descartes could not indicate that certain mental states are more like the exciting brain state than others ("so much the more . . ."). The point is rather that, while the exciting brain state will be, say, an instance of circular motion, the resulting sensory idea will be a color or perhaps an oval (the latter having claim to *limited* resemblance to its actual physical cause). By the same token, Descartes's *reason* for thinking the lack of resemblance in question establishes that ideas of sense are innate is not directly connected with the containment restriction on causality.

This passage suggests implicitly a view that is more overt in other passages—including one or two already cited: that the brain's causal role in the origin of sensation consists in (so to speak) forcing something on the mind's attention (even if not a full-fledged model for the subsequent mental idea). I will discuss the implications of this "presentational" model of the body-mind relation in sensation in the next section. But, setting this issue aside for the moment, I want to contrast the *Comments'* conception of the mind as actively forming ideas of sense, which it in some sense already possesses as dispositions, with the position stated elsewhere in Descartes's works, that the mind passively receives its ideas of sense from without.[45]

Descartes very often characterizes sensations as "passions" of the mind; this characterization rests on the commonsensical, phenomenological observation that the *will* plays no role in their origin, together with the further stipulation that for "only [the mind's] volitions are actions."[46] As we have seen, this doctrine indeed provides an important part of the basis for Descartes's arguments in the *Meditations* and the *Principles* that his (sensory) ideas of bodies are caused by bodies. When Descartes argues in the *Comments* that his ideas of sense are innate, he does not deal with the issue of involuntariness at all. Since it is not believable that he changed his mind—even temporarily—about whether ideas of sense are voluntary, one must suppose that he did relinquish—at least temporarily—the view that involuntariness is sufficient to establish an extra-mental origin.[47]

There are, then, two levels to the conflict between the implications Descartes draws from his mechanistic theory of perception in the *Comments* and the treatment of the origin of ideas of sense in his proofs of the existence of body. Not only are opposed conclusions offered concerning the source of sensory ideas of body, but also the account in the *Comments* raises problems of consistency with respect to what can be concluded from the fact that sensations arise in our minds independently of our will. In fact, by suggesting that the mind *does* something in sensation—"forms" its ideas—the *Comments* account seems generally at odds with Descartes's emphasis elsewhere on the mind's passivity in sensing.

Some progress may be made in resolving these conflicts if we allow that Descartes is simply expressing himself very loosely in passages concerned with proving the existence of body. For example, we may suppose that when he speaks of sensory ideas of body "coming from" body itself, he is expressing in misleading terms the notion that bodily motions do play the role of *exciting* our minds to form these sensory ideas (and nothing more).[48] In behalf of this reading we may appeal to the fact that even in the midst of the argument for the existence of body in the *Principles* he employs the phrase, "we perceive, or rather stimulated (*impulsi*) by sense we apprehend [matter] . . ."[49] Alternatively, we might suggest a qualification on Descartes's claims that ideas of *res extensa* and its modes come from the mind. Perhaps, after all, some sensory ideas of body really do "come to the mind from the body," in that the brain does exhibit *some* potential idea contents to the mind. Shapes, for example, really are present in the brain when we sense, and hence can be "exhibited to the mind" if any brain state can be, even though our specific sensible ideas of shape on a given occasion may not precisely "resemble" any shapes present in the brain at that time.[50] (This reading requires treating the *Comments* passage as a partial overstatement, while *also* reading the Meditation VI argument in a qualified way.)

These observations may help to reduce the impression of a hopelessly sharp conflict among certain of Descartes's statements about the source of ideas of sense. To me, though, they have a rather "cooked" feel. The most credible hypothesis is that when Descartes was primarily concerned with arguing for the existence of bodies, he drew on phenomenological observations to conclude that ideas of sense come from without the mind. In these circumstances, he found it convenient to interpret involuntariness as signifying causation from outside the mind. When he focused on the implications of his scientific account of perception, however, he concluded that ideas of bodies—even of shape or size—*could not* strictly come from bodies.[51] In these contexts, involuntariness is simply not allowed to count against a conclusion presented as evident on independent grounds.

In any case, I trust it is clear that the "reconciliations" I have tentatively proposed do not fully accommodate Descartes's actual statements. Further, they do not at all resolve the problem about how the mind, if truly "passive" in sensation, can help to bring about sensory ideas—as both the text of the *Comments* and the "containment" principle seem to require.[52]

IV

According to Descartes's account of sense perception in the *Comments,* the brain "exhibits" certain patterns of motion to the mind, which then, in response, brings to consciousness or actualizes appropriate innate ideas. This account provides an instance of what I have called the "presentation" model of the brain-mind relation in sensation. Such a conception is still more explicit in the passage from Descartes's much earlier work, *Treatise on Man,* cited at the end of section II. Recent Cartesian apologists have scarcely taken note of this model; those who have have not addressed its oddity.[53] In this section, I will first indicate more fully the range of texts in which versions of the presentation conception figure prominently, then sketch some of the problems that it involves (which are, it seems to me, all too obvious). Finally, I consider the relation of the presentation account to other models of sensation that occur in Descartes's works, particularly with respect to the question whether the presentation model needs to be taken seriously and "literally."[54]

It is important to notice, first, that Descartes freely employs the presentation model in discussing the brain-mind relation in imagination, memory, and the origin of emotion, as well as in sensation. Imagination, as well as sensation, is at issue in the *Treatise on Man* passage already cited. The account of imagination offered at the beginning of the Meditation VI is entirely cast in presentational terminology. The best explanation of the faculty of imagination, Descartes says, lies in the assumption that the mind is joined to a body "in such a way that it can apply itself at will to, as it were, inspect" that body (*ut ad illud veluti inspiciendum pro arbitro se applicet*) (AT VII, 73; CSM II, 51). As he further explains,

> . . . when [the mind] imagines, it turns to (*se convertat ad*) the body, and views (*intueatur*) in it something which conforms to an idea understood by itself [i.e., by the mind] or perceived by sense. (Ibid.)

In a letter to Arnauld, he says that for memory to occur it is not sufficient that traces be left in the brain by earlier thoughts; rather, it is necessary that there be traces such that "the mind recognizes that they were not always present in us but at some time entered de novo," traces that "when impressed are recognized by pure understanding to be new" (AT V, 220; K 234). In the *Rules,* Descartes says that sense, imagination, and memory are distinguished by the manner in which the mind, a purely spiritual power distinct from the body, "applies itself" to parts of the brain (AT X, 415–16). The presentation model also figures in Descartes's work on the passions. Thus—to cite a passage of exceptional oddity—he distinguishes the *passion* of joy from the corresponding active affect by noting that in the case of the passion, *impressions in the brain* represent a good to the soul (*luy representent*) as its own; whereas in the active affect—"purely intellectual joy"—the *understanding* represents a good to the soul as its own (PS II.91: AT XI, 396–67; CSM I, 360–61).

Second, the presentation model is at least strongly suggested by Descartes's various accounts of sensation—in *Treatise on Light, Meditations,* and other works—in terms of the motions in the brain giving the mind a sign to sense something (. . . *ibi menti signum dat ad aliquid sentiendum,* as he puts it in Meditation VI).[55] Perhaps such language does not strictly involve a picture of the mind's *noticing* something in the brain; but "receiving a sign" surely does normally suggest intelligent recognition, and it is difficult to think of a more natural reading.

Texts in which the presentation model of sensation occurs independently of the "sign" terminology include *Passions of the Soul* and *Conversation with Burman,* as well as *Treatise on Man.* In *Passions,* Descartes argues that the double sensory (e.g., visual) images from a given object must be united at some place in the brain, so that only one object is "represented" to the soul (PS I, 32: AT XI, 352–53; CSM I, 340). But perhaps most impressive is a comment quoted by Burman (though of course Burman's reports cannot be taken as absolutely authoritative). When Burman asked Descartes about his use of the term *'inspicere'* in the discussion of imagination at the beginning of Meditation VI, Descartes's clarification (according to Burman's report) began as follows:

> It is a certain special mode of thinking, which is like this. When external objects act on my senses, and paint on them the idea, or rather figure of themselves, then the mind, when it turns to (*advertit*) these images which are thus painted on the gland, is said to *sense* . . . (AT V, 162; CB 27)

Descartes's main purpose in most of the passages concerned with perception may be to get across the idea that mental perceptions *aren't pictures* somehow transferred up from the brain into the mind. Nevertheless, his use of the presentational model suggests that he does retain to some extent an element of the view that the mind *apprehends a physical intermediary* in the process of perception, *not just* the distant object normally said to be perceived and *not just* the *mental* idea that is, as he says in the *Meditations*, the only thing we "properly and immediately sense" (AT VII, 75; CSM II, 52).

The oddities of the presentational model are obvious. The model suggests that the mind perceives external bodies by virtue of perceiving, or otherwise recognizing, something *else:* traces or motions in the brain. But it neither explains how it is possible for the mind to do *this,* nor tells us why the question of how the mind does this is not as legitimate as the original question about how perception of external things takes place.

Apart from its intrinsic strangeness, the presentation conception seems to conflict with fundamental Cartesian doctrine about the mind. The Cartesian mind is, after all, supposed to be conscious of its perceptions.[56] Yet it seems that we, as minds, are not conscious of these brain state perceptions or of receiving "signs" from the brain, but only of cups and saucers, tables and chairs, other human bodies, and the like.[57]

Cartesian apologists might suggest, in response to this criticism, that the presentation model is merely "metaphorical"—a harmless *façon de parler*.[58] In support of this view, Descartes's defenders could point to passages which suggest a less objectionable associationist conception and even to at least one passage that seems almost directly to ridicule the presentation conception.[59]

I don't at all deny the importance of such passages. (I will discuss some of them shortly.) Nor do I deny that some of Descartes's descriptions of the body-mind relation in sensation have to be taken less than literally. At the same time, however, I consider highly dubious the notion that the "presentational" passages can reasonably be shrugged off as innocently figurative. On balance, it seems more reasonable to believe that Descartes did not sharply or consistently distinguish a "literal" associationist view of the body-mind relation in sensation from a "metaphorical" presentation conception. Rather, the two conceptions existed more or less on a par in his thought, dominating different texts at different times. I will briefly indicate some reasons for taking the difficult presentational model more seriously than the "merely metaphorical" reading will allow before I focus on what I see as the alternative associationist conception.

As noted in Section II, Descartes occasionally says that the brain "impresses" or "imprints" sensory ideas on the mind. We have conclusive reason to interpret *these* passages as "merely metaphorical": not only does Descartes himself explicitly characterize one of them in this way, but the reason he offers for rejecting a literal reading is conclusive (within his dualistic framework).

In the *Rules,* he first says that talk of the brain taking on impressions from external objects as wax takes on impressions from a seal is *no* mere analogy. We can also say, he adds, that in receiving figures from external sense the mind resembles a seal, but in this case we *are* merely speaking analogically for "nothing at all like this [mental] power is to be found in corporeal things" (AT X, 415; CSM I, 42). In other words, conscious "reception" of ideas is not literally ascribable to a material thing like a seal. (Further, of course, we know that anything that *literally* receives "impressions" must be extended.)

We cannot argue along similar lines, however, that the power to perceive or notice or attend cannot literally be ascribed to the mind, for this is just the sort of thing that the mind does. Thus Descartes's own way of explaining why the "imprint" model has to be interpreted metaphorically cannot readily be adapted to the presentation model.

A further relevant difference between the imprint and presentation accounts of sensation lies in the fact that, while Descartes only *occasionally* uses the imprint or impact terminology with respect to the brain-mind relation, the presentation model is extremely pervasive. As we have seen, it is prominent in Cartesian texts from the very early (the *Rules* and *Treatise on Man*) to the very late (*Comments* and *Passions*). In some of these texts it is quite elaborately developed with virtually no hint that a mere *façon de parler* is intended. Also significant, in my view, is the fact that the fairly detailed discussion of imagination in Meditation VI really requires that the presentation model of brain-mind relation be taken *quite* literally with respect to *that* mental power at least.

Finally, one must not overlook the fact that (if we can trust Burman's report) Descartes actually reinforces the presentation conception when given the opportunity to explain that he did not intend it to be taken literally.

Altogether, then, the Cartesian apologist who proposes to shrug off the presentation model as an incidental figure of speech has quite a bit of explaining away to do. It would be too rash to say in advance of the attempt that such a salvage enterprise will necessarily prove futile, but I hope to have established at least a presumption that it will be difficult. I now turn to the texts which present a more austere and, I think, clearly more palatable conception of the body-mind relation in sensation—texts which avoid both the imprint (or impact) and the presentational conceptions.

V

There surely are numerous passages in Descartes's scientific and philosophic works which suggest something approaching an associationist conception of the relation between brain states and sensory ideas. And there is one such passage which at least verges on direct ridicule of the presentation view. The latter passage occurs in the *Dioptrics*. In this important text, Descartes himself makes fun of the idea that there are "other eyes in our brain" with which we perceive the images that form there. In this passage, the rejection of the conception of perception in terms of the transmission of pictures or replicas extends, it seems, to a general rejection of the presentation model. Here Descartes explains that it is not by means of resemblance to external things that a picture in the brain "makes us perceive the object, as if there were yet other eyes in the brain with which we could perceive (*appercevoir*) it." Rather, he says,

> . . . it is the motions of which the picture is composed which, acting immediately on (*agissans contre*) the mind in as much as it is united to our body, are so established by nature as to make it have such perceptions . . . (AT VI, 130; CSM I, 167)[60]

Certain other passages similarly describe the brain-mind relation in sensation in terms which suggest a mere brute conjunction. Consider, for example, the following statement from Descartes's correspondence:

> It is not surprising that certain movements of the heart are thus naturally joined to certain thoughts, which they have no resemblance; for, from the fact that our soul is of such a nature that it could be united to a body, it has also this property, that each of its thoughts can be so associated with certain motions as dispositions of the body that when the same dispositions recur in the body they induce (*induisent*) the soul to the same thought. (To Chanut, Feb. 1, 1647: AT IV, 604; K 210)

Finally, one might point to one of Descartes's well-known letters to Princess Elizabeth in which he asserts that the notion of body-mind interaction derives from the "primitive" notion of mind-body union, which must not be confused either with notions applicable to mind only, like thought, or notions applicable to body only, like extension:

> . . . there are in us certain primitive notions, which are like originals on the pattern of which we form all our other knowledge. And there are very few such notions; for, after the most general, of being, number, duration, etc., which apply to all

> that we can conceive, we have only, for body in particular, the notion of extension, from which follow those of figure and motion; and for the soul alone, we have only that of thought, in which are included the perceptions of the understanding and the inclinations of the will; finally, for the soul and the body together, we have only that of their union, on which depends that of the force which the soul has to move the body, and the body to act on the soul, in causing its sensations and passions (*& le corps d'agir sur l'ame, en causant ses sentiments et ses passions*). (May 21, 1643: AT III, 665; K 138)

Descartes goes on to say that error arises if one doesn't carefully distinguish these notions according to their appropriate sphere of application, or if "we want to explain one of these notions by another; for being primitives, each of them cannot be understood except by itself" (AT III, 666; K 138). We get into this sort of trouble, he suggests, if we try to understand the mind's action on the body in terms of one body's moving another (as Elizabeth may have been doing).

Some critics sympathetic to Descartes have taken such passages as these as grounds for interpreting the relation of body-mind causation in the Cartesian system as a "primitive" relation that creates no peculiar intelligibility problems. Robert Richardson has claimed (primarily on the basis of the remarks to Elizabeth) that this relation between body and mind is analogous to that expressed in explanations in terms of basic physical forces.[61] And Louis Loeb seems to suggest obliquely that Cartesian interaction could beneficially be viewed in Humean terms of mere constant association of brain states and sensory ideas.[62] In support of this suggestion, one may adduce Descartes's talk of the brain state-idea connection as a relation of "association" (in the passage from a letter quoted above) together with his frequent stress on the *arbitrary* and *contingent* nature of the connection between particular brain states and the sensory ideas consequent upon them.[63] Thus we may perhaps say, giving weight to these texts, that Descartes is at least within reach of a conception of body-mind causation that is neither more nor less "intelligible" than body-body causation turns out to be on certain reasonably respected analyses.

On the basis of the arguments and exposition presented in Sections II–IV, I would of course deny that we can ascribe to Descartes consistent adherence to conceptions of causality in general, and of mind-body interaction in particular, that are easily aligned with views in fashion since Hume. Besides acknowledging Descartes's endorsement of restrictions on the causal possibilities (as represented, particularly, by his "containment" principle), one must also take note of his argument that ideas of sense have to be innate, since they don't "resemble" any purported physical causes. In addition, one must come to terms with his non-associationist "presentation" characterization of the brain-mind relation.

I agree with Loeb and Richardson, however, to the extent of granting that Descartes comes closest to advancing a *tenable* conception of body-mind causality when he steers clear of both the "imprinting" and the "presentation" models in favor of more nearly "associationist" conceptions suggested by certain statements. Still, I think they are too optimistic in their interpretations of even the favored passages. In the last section, I will argue that their interpretations require certain adjustments which move Descartes's "best" statements about body-mind causation in sensation further from a modern or a Humean viewpoint than they allow. I will also summarize the conclusions I hope to have established in the paper as a whole, concerning the strengths and limitations of recent defenses of Descartes, as they relate to his position on the origin of sensation.

VI

Promising as Descartes's talk of the "primitive" nature of the body-mind relation may appear, his elaboration of this concept in a later letter to Elizabeth shows that his conception is not the sophisticated one attributed to him by Richardson, but something far more specious. In this later letter, after noting that the soul is conceived by pure understanding, and the body by understanding aided by imagination, he explains that the body-mind relation can't be clearly understood at all but is simply "sensed":

> . . . I observe a large difference between these three sorts of notions, in that the soul is only conceived by pure understanding; the body, that is extension, figures, and motions, can also be conceived by understanding alone, but much better by understanding aided by imagination; and finally, things which pertain to the union of the soul and the body, are only known obscurely by understanding alone, or understanding aided by imagination; but they are known very clearly by the senses. (June 28, 1643: AT III, 691–92; K 141)

Descartes fails to explain, however, how this indistinct (if "clear") sensory "knowledge" can be admissible in a legitimate theory (especially one that tends to insist on the inferential nature of our knowledge of the existence of body). And he certainly fails to explain how it ties in with the account of sensation he elsewhere insists on, according to which movements in the brain cause or excite the mind to have ideas of sense. (Surely *that* account is not itself based on sense; the senses could hardly be supposed to tell us—"in the ordinary course of life", as Descartes adds—that brain states give rise to mind states according to correlations instituted by nature.) Descartes, in short, does not assert to Elizabeth the sophisticated view that Richardson's analogy with "basic forces" might suggest: that body-mind (or mind-body) causation is an irreducible *theoretical* primitive. Rather, in his discussion with her, he departs from the level of theory altogether, implying that the notion of mind-body interaction is irreducible in the sense that you just *feel* it. For these reasons I believe that Richardson's sympathetic interpretation is less well grounded in the texts than he supposes.

The same may be said of Loeb's reading of Descartes's statement quoted above from the Feb. 1, 1647, letter to Chanut as a "foreshadowing of a Humean, constant conjunction, or regularity analysis of causation."[64] Despite Descartes's use here of the term "association" for the relation between physical and mental states, several phrases in the passage indicate that he is still thinking of the relation as consisting in more than *mere* association:

> There is no reason to be surprised that certain motions of the heart should be *naturally connected in this way* with certain thoughts, which they in no way resemble. The soul's *natural capacity for union with a body brings with it the possibility of* an association between thoughts and bodily motions or conditions so that when the same conditions recur they *induce* the soul to the same thought; and conversely when the same thought recurs, it *disposes* the body to return to the same condition.[65]

Although I think Loeb is wrong in suggesting that Descartes comes close to espousing pure Humean associationism in the passages he cites, I still agree with him that Descartes does, in these passages, express a certain nonchalance about which classes of entities or states can be linked by the causal relation (whatever exactly the latter may be). The passages, in other words, do conform to Descartes's direct denial of the heterogeneity problem in the polemical statements that Loeb and other apologists particularly stress.

One final problem needs to be mentioned in connection with attempts to assimilate Descartes's position on body-mind interaction either with causal relations at the level of basic forces, or with traditional Humean doctrine. At *Treatise* I, iii, 14, Hume specifies that causes and effects must be spatially, as well as temporally, contiguous.[66] Basic forces, even if not appropriately described as "contiguous," presumably do operate within an encompassing spatial framework. Whether body-mind interactions satisfy any spatial constraints is a perplexing question, however.[67] Some would say that the spatial condition can harmlessly be dropped in the case of body-mind causality.[68] Others might prefer to defend the view that a spatial contiguity condition intelligibly applies, even in this case.[69] I do not deny that an acceptable resolution of the issue may be possible, one way or another. My point is just that published defenses of Cartesian interactionism that interpret this position in terms of relatively sophisticated modern views have so far failed adequately to address the spatiality issue—or even to take note of it.[70]

VII

CONCLUSION

I have argued that recent defenders of Descartes are correct in maintaining that he conceived of the body-mind relation in sensation as one of efficient causation and in denying that the "heterogeneity objection" has received compelling defense. Although they have raised reasonable objections to claims that Descartes's causal principles rule out body-mind causation, some room remains to question the compatibility of Descartes's causal principles with his accounts of body-mind causality in sensation. I have pointed out problems in reconciling texts in which Descartes holds that all ideas of sense—particularly the most "confused" ideas of the qualities of bodies—are innate with texts that indicate that our ideas of bodies have to come from without. I have tried to establish the prominence of the presentation model of sensation in Descartes's works and have questioned the view that this model—with all its difficulties—can be dismissed as a mere figure of speech. Finally, I have acknowledged the strong presence in many texts of a conception of the relation of brain states to mental sensory ideas which seems to avoid the problems of the presentation model. I have argued, however, that certain attempts to construe this non-presentation conception as foreshadowing respected modern views about causal connections neglect significant features of Descartes's actual statements; they neglect other peculiarities of the interactionist doctrine as well.

NOTES

I am grateful to many people—too many, I regret, to mention individually—for comments in discussion and in writing on earlier versions of this paper. But I do want particularly to thank John Cottingham for incisive suggestions which have influenced the present version at several points. I also thank Princeton University for support of a year of leave during which much of the work on the paper was completed.

The following abbreviations are used in the references:

A. EDITIONS OF DESCARTES'S WRITINGS

AT	*Oeuvres de Descartes*, ed. C. Adam and P. Tannery, 12 vols. (Paris: J. Vrin, 1957). Reprint of Cerf ed.1897–1913.

CSM	*The Philosophical Writings of Descartes*, trans. by John Cottingham, Robert Stoothoff, and Dugald Murdoch, Cambridge, 2 vols. (Cambridge: Cambridge UP, 1984).
CB	*Descartes' Conversation with Burman*, trans. John Cottingham (Oxford: Clarendon Press, 1976).
	Treatise on Man, trans. Thomas Steel Hall (Cambridge, MA: Harvard UP, 1972).
K	*Descartes: Philosophical Letters*, trans. and ed. Anthony Kenny (Oxford: Clarendon Press, 1970).
O	*Discourse on Method, Optics, Geometry, and Meteorology*, trans. Paul J. Olscamp (Indianapolis: Bobbs-Merrill [Library of Liberal Arts], 1965).

B. WORKS OF DESCARTES

Diop	*Dioptrics*
Med	*Meditations*
NiP	*Notae in Programma* (formerly known as *Notes against a Program*, but translated by CSM as *Comments on a Certain Broadsheet*).
PP	*Principles of Philosophy* (cited from Latin version unless the French version [FV] is specifically indicated).
PS	*Passions of the Soul*
RO	*Replies to Objections* (to the *Meditations*)
Rules	*Rules for the Direction of the Mind*
TL	*Treatise on Light*
TM	*Treatise on Man*

1. Diop iv: AT VI, 109; CSM I, 164. Although I cite standard English editions, translations in the paper are my own.
2. See R. C. Richardson, "The 'Scandal' of Cartesian Interactionism," *Mind* 91 (1982): 20–37.
3. See Daisie Radner, "Descartes' Notion of the Union of Mind and Body," *Journal of the History of Philosophy* 9 (1971): 159–70; and Radner, "Is There a Problem of Cartesian Interaction?" *Journal of the History of Philosophy* 23 35–49. 35–49. In "Adequate Causes and Natural Change is Descartes' Philosophy", *Human Nature and Natural Knowledge*, ed. A. Donagan, et al. (Festschrift for Marjorie Grene) 107–22, Janet Broughton argues that body-mind causation is imcompatible with Descartes's restrictions on causation on the assumption (which she endorses) that eminent containment is not a relevant possibility in this case.
4. Cf. S. V. Keeling, *Descartes*, 2nd ed. (Oxford: Oxford UP, 1968) 153: "The defining attributes of body and of mind being wholly different and mutually exclusive, direct causal interaction between them, [Descartes] maintains, is necessarily impossible." (Keeling supplies no references in support of this attribution.) Compare Martial Gueroult, *Descartes selon l'ordre des Raisons*, vol. 2 (Paris: Aubier-Montaigne, 1968) 84. Gueroult interprets Descartes as holding that the action of body on mind, *despite being inconceivable and contradictory*, is nevertheless actual. (He cites in this connection Descartes's doctrine that God is not bound by the limits of our understanding.)
5. Keeling, in the work cited above, is one example. A more recent proponent of this type of view is John Yolton, in *Perceptual Acquaintance from Descartes to Reid* (Minneapolis: U of Minnesota P, 1984). Like Keeling, Yolton seems to attribute to Descartes himself the view that it is unintelligible to assume causal relations between substances of diverse natures, and hence such causality is impossible—although Yolton's attribution is less definite than Keeling's: " . . . Descartes was confronted with the difficulty of how causation could work across categories, between body and mind, from physiology to psychology. There can in fact be no causal relation between

such diverse substances, but the relation is nontheless intimate." Like Keeling, Yolton provides no direct textual support for the suggestion that Descartes recognized this "difficulty."

In the paper cited in note 3, Broughton argues the Descartes *came* to reject body-mind causation, specifically in NiP.

6. Besides Richardson's paper cited in note 1, the following works defend these claims or closely similar ones: Louis E. Loeb, *From Descartes to Hume* (Ithaca, NY: Cornell UP, 1981) 134–56; Eileen O'Neill, *Mind and Mechanism: An Examination of Some Mind-Body Problems in Descartes' Philosophy*, diss. Princeton U, 1983; and O'Neill, "Mind-Body Interaction and Metaphysical Consistency: A Defense of Descartes," *Journal of the History of Philosophy* 25 (April, 1987): 227–45; Mark Bedau, "Cartesian Interaction," *Midwest Studies in Philosophy* 10 (1986): 483–502. See also Richardson's and Loeb's "Replies to Daisie Radner's 'Is There a Problem of Cartesian Interaction?'" *Journal of the History of Philosophy* 23 (1985): 221–31.

   Issues raised by these writers, and discussed here particularly in Section II, have recently also been discussed by Nicholas Jolley in "Descartes and the Action of Body on Mind," *Studia Leibnitiana* 19 (1987): 41–53; and Tad. M. Schmaltz, "Sensation, Occasionalism, and Descartes' Causal Principles," *North American Kant Society Studies in Philosophy*, I (forthcoming). Another manuscript of Schmaltz's, "Descartes on Innate Ideas, Sensation, and Scholasticism: The Response to Regius," forthcoming in *Oxford Studies in the History of Philosophy*, vol. 2, ed. M. A. Stewart, also deals with certain issues concerning the origin of sensation in Descartes that I take up particularly in Sections III and IV. I obtained these papers too late to reflect their positions fully in this text, though I mention some points of convergence in the notes. Schmaltz had access to an earlier draft of this paper in preparing his work, and I had seen some of his in much earlier form; but (as he notes) we largely arrived at our views independently.

7. I will be directly concerned here only with the issue of effects of body on mind (specifically, in sensation), not with the effects of mind on body in voluntary action. For a good, sympathetic treatment of Descartes's position on causation in the mind-body "direction," see Daniel Garber, "Understanding Interaction: What Descartes Should Have Told Elisabeth," *Southern Journal of Philosophy* 21, Supplement, 1983, 15–32.

8. See also PP IV. 191: AT VIII–1, 318; CSM I, 282:

   > . . . [the nerves in the skin] excite (*excitant*) as many different sensations in the mind as there are different ways in which they are moved, or their ordinary motion prevented . . .

9. *Meteors*, viii: AT VI, 334; O, 338; To Elizabeth, May 21, 1643: AT III, 665; K 138. In the *Meteors* passage, Descartes talks of motions impinging on the eyes as causes of sensation; in the letter to Elizabeth (further discussed in section V) of the (human) body as cause. See also AT VII, 165; CSM II, 117 (RO II), and AT XI, 346; CSM I, 337 (PS I.23), where Descartes speaks of our perceptions as "caused by" the objects we take ourselves to perceive. In the letter to Newcastle (October, 1645: AT IV, 326–27; K 182), Descartes in two consecutive sentences talks of movements in the brain "exciting" sensation in the soul, "making" it sense colors and light, and "causing" sensations of thirst and hunger.

   It should be stressed that English translations of Descartes—even the best ones—are of no help whatsoever as guides to his use of these terms.

10. See also, e.g., AT VII, 87; CSM II, 60 (Med VI) and AT IV, 604; K 210 (to Chanut, Feb. 1, 1647).

11. See Diop vi: AT VI, 140; O 107.

12. From another point of view the associations between particular brain movements and particular sensations are not arbitrary: rather they reflect the goodness and wisdom of God. Descartes stresses this point both before and after the statement just quoted. He explains that any particular movement "occurring in the part of the brain that immediately affects the mind produces just one corresponding sensation." Experience shows,

he goes on to say, "that the sensations which nature has given us" are just the ones most conducive to the preservation of the body in the face of the particular sensory stimulation producing them; this arrangement clearly bears witness "to the power and goodness of God" (AT VII, 87–88; CSM II, 60–61). The "pain as if existing in the foot" example is an illustration of this general claim. This quasi-teleological feature of Descartes's position will not further concern me here, however.

13. Descartes speaks of sensations of smell in similar terms in the preceding paragraph and of the soul being given occasion to feel pain and tingling a few pages earlier (AT XI, 144–45; H 37–38). In between he talks of the motion in the nerves "making the soul have" feelings of heat and cold and of small particles of food "making the soul sense" agreeable (or other) tastes (AT CI, 145, 146; H 39, 41). Such casual alternation of locutions (which one could never divine from Hall's translations) strongly suggests that Descartes did not intend any major opposition between "giving occasion to" and "making."
14. Other passages in which Descartes employs the "occasion" terminology include AT VI, 144; CSM 166 (Diop IV); and AT IX–2, 64 (PP II.1, FV). See also AT XI, 4; CSM I, 81 (TL I): "our mind represents to us the idea of light each time our eye is affected by the action which signifies it."
15. See also AT X 415–16; CSM I, 42 (*Rules* XII); AT VII, 73; CSM II, 51 (Med VI); AT V, 162–63; CB, 27. This type of description is used particularly in connection with Descartes's theory of imagination, but also (as the quoted passage shows) sometimes in connection with sensation. I regard it as exemplifying a "presentation" model of the brain-mind relation in sensation; I discuss the significance of this type of description in section IV.
16. Cf. e.g., AT VIII–1, 320, 1.22 (PP IV, 196).
17. "*. . . non video qua ratione posset intelligi ipsum [Deum] non esse fallacem, si aliunde quam a rebus corporeis emitterentur*" (AT VII, 80; CSM II, 55 [Med VI]; cf. AT VII, 135; CSM II, 97 [RO II] and AT VIII–1, 40–41; CSM I, 223 [PP II.1]).
18. Yolton, in *Perceptual Acquaintance,* appears to assume that there is some kind of evident opposition between describing the body-mind relation as causal and describing it in terms of "sign-giving." Unfortunately, he gives no defense of his assumption, which seems strongly at odds with Descartes's persistent use of causal terms like '*faire*' and '*inferre*' in passages cited by Yolton himself. Broughton, in "Adequate Causes," does give reasons for thinking the occasionalist terminology in NiP signals that Descartes has abandoned the view that body acts on mind. Her arguments seem to me rather tenuous, however, and she does not take into account the facts that (a) Descartes mixes causal talk with occasionalist talk in other works—including the very early *Treatise on Man* and *Dioptrics*; and (b) the later *Passions* seems unblushingly interactionist. For reasons presented in section III, I do agree that the particular concept of the body-mind relation in sensation that Descartes expresses in *Comments on a Broadsheet* is not fully consistent with that presented in the *Meditations* and *Principles;* but this is not to say that the relation is no longer one of efficient causality.

    Against what I say here someone may want to argue that when *Malebranche* later talks of bodily states giving occasion *to God* to cause sensations, he is particularly trying to avoid the implication that God is just an extra link in the causal chain. (In fact Malebranche holds that finite entities or states are never causally efficacious, inasmuch as they do not truly necessitate any sequal.) Whether Malebranche's conception of "providing occasion to God" is really intelligible is another matter, however; and there seems no particular reason to saddle Descartes with its murkier elements of his successor's philosophy, just because he used the same term (in a non-theocentric context).
19. In fact, it's hard to understand how the brain can "give the mind signs" even if a an underlying causal relation is *not* ruled out. I return to this issue in Section IV.
20. See also Descartes's letter to Hyperaspistes, August 1641, AT III, 424; K 112. In the Clerselier letter, Descartes indicates that people who accept "real accidents" suppose that they can act on body, even though there is "more difference" between such

(supposed) accidents and corporeal substance than between two substances; in the Hyperaspistes letter, he remarks that real accidents are supposed to be "completely different in kind" from substance. John Cottingham has suggested (in correspondence) that Descartes is offering an *ad hominem* or *tu quotue* response to the objection, which does not necessarily indicate that he really sees no difficulty in it. It seems to me, however, that this denial of the heterogeneity objection is quite categorical—even though he does stress that certain of his contemporaries are at least as committed to denying it as he is. (I do not know whether Cottingham meant to suggest that Descartes supposed that the people to whom he was actually replying accepted the "real accident" metaphysics. It seems clear to me that Descartes was not making any such assumption.)

In "Cartesian Interaction," Mark Bedau characterizes the form of Descartes's response as "dialectical." Bedau sees Descartes as indicating that his (scholastic) objectors are not in a position to object to mind-body interaction. (But Bedau does not take this line of response as a sign that Descartes himself is wavering on the issue of the possibility of substances of different natures interacting.) Bedau also does not explain whether he takes Descartes to believe that the critics to whom he is actually replying accept the "scholastic" doctrine in question.

21. They fairly cite past writings of my own as exemplifying this fault.

22. There is a passage from the *Principles*, promoting mechanistic explanations of natural phenomena against scholastic ones, which Radner (in "Descartes' Notion") and Broughton (in "Adequate Causes") present as evidence that Descartes regarded causation between substances of different natures as inconceivable:

> . . . we very well understand in what manner(*pacto*) various local motions in one body are excited by the various size, figure, and motion of the parts of another body; but in no way can we understand in what manner from these same things (i.e., magnitude, figure, and motion) something else would be produced, of an entirely different nature from them, such as are those substantial forms and real qualities, which many suppose to be in things. (PP IV.198: AT VIII–1, 322; CSM I, 285).

O'Neill ("Mind-Body Interaction," 242ff.) and Bedau ("Cartesian Interaction", 485ff.) offer interpretations of the passage which render it compatible with the assumption that (it is conceivable that) substances of different natures do interact. Bedau tellingly observes that in the very next sentence Descartes goes on to insist that local motions are sufficient to excite all sensations in the soul (*diversi motus locales sufficiant ad omnes sensus in ea excitare*)! In fact Descartes adds that we "experience" that motions excite sensations in the soul (but we don't apprehend that anything other than motions go from the external organs to the brain). Descartes presumably could agree that mechanistic explanations are more thoroughly intelligible than the "how" of body-mind interaction, while maintaining that scholastic accounts of natural phenomena, unlike postulations of body-mind causation, (a) are eliminable in favor of more transparent mechanistic ones; and (b) postulate entities of which we have no direct awareness.

23. As shown in Section I, Descartes does occasionally use mechanistic-sounding terms like 'impress' to characterize the body's mode of action on the mind. It seems only fair, however, to assume that he does not intend such terms to be understood literally in such contexts. (I will return to this point in Section IV.)

24. Besides works previously cited by Loeb, O'Neill, Richardson, Bedau, and Broughton, see Kenneth Clatterbaugh, "Descartes' Causal Likeness Principle," *Philosophical Review*, Vol. LXXXIX, 1980.

25. See Clatterbaugh's paper, cited above.

26. See Loeb, *Frome Descartes to Hume*, 140–41 and Bedau, "Cartesian Interaction", 484–85.

27. Broughton, "Adequate Causes," and O'Neill, "Mind-Body Interaction."

28. Clatterbaugh's most direct support for attributing to Descartes the principle that the cause must be "like" the effect is a passage from the *Conversation with Burman*—which of course is not a work of Descartes himself (AT LV, 156; CB, 17). (In any

case, in the passage in question Descartes goes on to say that the "remote" likeness between God and a stone is sufficient to satisfy the principle.)

The strongest grounds for attributing to Descartes a likeness principle are perhaps found in his argument in NiP, discussed below, that the ideas (qualities) of external things must be innate in the mind, since they don't resemble anything actually found in the brain. But I argue that the motivation for this position is independent of a general causal likeness principle.

29. See for instance Med III: AT VII, 41; CSM II, 28. It is by no means clear from Descartes's presentation here that he himself sees any significant distinction between the "reality" principle and the "containment" principle. If the latter reduces to the former, then bodily states presumably can unproblematically cause ideas, as explained above in the text. The "worst case" for Descartes's defenders depends on the assumption that the containment principle amounts to a *stronger* condition, by virtue of implying that either the cause must literally "have" the effect to start with, or it must possess something *superior* to the effect (not just something *equal* in reality to the effect). Because the latter, non-reductionist interpretation is at least arguable, it is worth seeing whether it is compatible with body-mind causation.

    One interesting reason for thinking that the containment principle must imply a stronger constraint than the reality principle has to do with the substance-mode relation. By general consensus, substances are supposed to be higher in the reality hierarchy than modes, so it would seem that, under the reality constraint alone, any substance would be up to producing any mode. But Descartes does not seem to entertain the possibility that *res extensa* can cause motion in itself (See his Letter to Henry More, August 1649: AT V, 404; K 258). Further, in Meditation III, considering explicitly whether he, as substance, contains the distinctly perceived modes of body eminently, he allows only that "it seems possible that" this is so (AT VII, 45; CSM II, 31).

30. Letter to Mersenne, December 31, 1640: AT III, 274; K 91.

31. In fact there is room for some debate about the precise conditions of "formal containment": see O'Neill, "Mind-Body Interaction," 235ff; and compare Gueroult, *Descartes selon l'Ordre*, II, 77, n. 3. But the subtleties of this issue aren't really essential to the argument here.

32. Med III (FV): AT IX–1, 32; CSM II, 28 (see n.2); Med VI: AT VII, 79; CSM II, 55. See also O'Neill, "Mind-Body Interaction" for a defense of this conception of eminent containment.

33. O'Neill holds that eminent containment requires that the cause does not formally contain the effect, and that it is more perfect than anything that can contain the effect formally. This interpretation does seem to conform to the examples of eminent containment she cites from Descartes and also fits well with Descartes's insistence that *res extensa* (a substance) cannot cause motion (a mode) in itself. (See note 28.) But, as she recognizes, it is not easy to establish exactly what 'eminent containment' meant to Descartes, given his rather loose and vague explications of the term.

    O'Neill, incidentally, holds that Descartes claims explicitly that mind is more perfect than body. Her references do not precisely substantiate that claim, however. In her main citation—a letter to Elizabeth—Descartes says that the mind is "much more noble" than the body. She also cites Principles I.23 where Descartes concludes that God is not extended, on the ground that extension implies divisibility, an imperfection. But this passages does not tell us that *finite* minds are more perfect than body or bodies. (Jolley, in "Descartes on the Action of Body on Mind," 45, draws the same conclusion from a passage in the Second Replies; but this passage, too, is concerned with the issue of absolute perfection, rather than finite substances.)

34. "*un ouvrage de l'esprit.*" Although no corresponding phrase occurs in the Latin original, the basic intent is constant: the formal reality of an idea ('idea' in the first sense) derives from the mind, but its representative content ('idea' in the second sense) may require an external cause.

35. One who uses this line of reasoning to reconcile body-mind causation with the containment principle must actually hold that every mental mode with a physical cause has a partial mental cause as well. In a discussion of an earlier version of this paper, Richard Foley persuaded me that this assumption is viable.

    In "Descartes on the Action," Jolley takes a similar approach to the same problem, but he concludes that the formal reality of ideas is caused by *God.*

36. I ignore the following question, which does come to mind in connection with the mind's alleged causality of its ideas: in what sense can the mind be said to contain its ideas (as operations of the understanding) *prior to their occurence?*

    (It should be noted, though, that in "Descartes on Innate Ideas," Tad Schmaltz argues that Descartes's position in *Comments on a Broadsheet* requires that the "content" of ideas of sense also be derived from the mind, though not from its intellectual faculty.)

37. My proposal for partial reconciliation of the containment principle with body-mind causation owes a good deal to O'Neill's discussion in *Mind and Mechanism* and to Broughton's in "Adequate Causes." My suggestion, however, requires rejecting Broughton's view that the Meditation VI proof of the existence of body must be taken to rule out the relevence of eminent containment altogether with respect to the causation of ideas of sense. It is true that Descartes seems to say there that if matter is the cause of ideas of sense, then the cause will contain formally all that is in the ideas objectively. But he also quickly goes on to indicate that only what is clearly and distinctly conceived of body is really in external matter. Either he has implicitly qualified the initial broad stance in the course of his argument, or he is implicilty denying that mere sensations (confused ideas) have objective reality. (On the latter notion, see M. D. Wilson, *Descartes,* New York: Routledge and Kegan Paul, 1978, 101ff.)

    I differ from both O'Neill and Broughton in putting no weight, in the present context, on Descartes's statements that "the nature of the mind is such" that motions in the brain are sufficient to excite in it all sorts of sensations. While such statements do indicate some kind of contribution of the mind in the occurrence of sensation, they less clearly suggest *efficient* causality than the remarks I cite from Meditation III. And (as Paul Hoffman has stressed, in correspndence) Descartes does construe the containment principle as concerned specifically with efficient causation.

38. The same conclusion is reached in a slightly different way by William E. Seager, "Descartes on the Union of Mind and Body," *History of Philosophy Quarterly.* 5.2 (April, 1988): 126. (Seager's paper touches on several of the same issues that I take up here, but focuses on one that I largely set aside for reasons of space: the nature of mind-body union in Descartes and the relevance of this notion to the intelligibility of Interaction.)

39. . . . whatever we sense without doubt comes to us from some thing, which is different from our mind. For it is not in our power to bring it about that we sense one thing rather than another; but this clearly depends on that thing which affects (*afficit*) our senses. One can indeed ask whether that thing is God, or something different from God. But because we sense, or rather stimulated by sense we clearly and distinctly perceive, a certain matter extended in length, breadth, and depth, various parts of which have various figures and are moved with various motions, and also bring about that we have various sensations of colors, odors, pains, etc.: if God immediately by himself exhibited (*exhiberet*) this idea of extended matter to our mind, or even if he brought it about that is was exhibited by some other thing, in which there was no extension, or figure, or motion: no reason could be found why he should not be regarded as a deceiver. For we clearly understand it as a thing completely different from God and from us, or from our mind; and also we seem clearly to see that the idea of it comes (*advenire*) from things placed outside us, to which it is entirely similar. . . . (AT VIII–1, 40–41; CSM I 223).

    See also *Second Replies,* AT VII, 135; CSM II, 97; *Fifth Replies,* AT VII, 367; CSM II. 253; and *Passions of the Soul* xvii, AT XI, 342; CSM I 335.

40. One might assume that if the cause of an idea-content doesn't exactly exemplify that content, it doesn't formally contain it either. If this is so, then to the extent that

Descartes backs off from holding that bodies acting on our minds exactly exemplify the qualities we "perceive" by sense, he loses one way of reconciling body-mind causation with the containment principle. The issue is a complicated one though. It is not clear, for instance, whether or not a body moving at velocity m+n "formally contains" velocity m; nor whether a body 300 miles wide "formally contains" a width of one mile, etc.

41. See also the comments on "workmen" in the next article of *Comments.*
42. For another brief expression of essentially the same claim, see Descartes's letter to Mersenne, July 22, 1641; AT III, 418; K 108.
43. See also K 108, to Mersenne, 7/41.
44. Again, this terminology need not be construed as an implicit deniál of causality. Employing terminology favored by Gueroult (*op.cit.*, II, 102–03), we may say that—in passages such as this—Descartes construes physical states as *occasional* causes of ideas, but denies that they can be *exemplary* causes. (As noted already, it is not Descartes's position that ideas are actually, occurrently in the mind at all times, independent of any external causal influence. Rather, he says in the *Comments*, "innate ideas" are "in" the mind merely as dispositions until an appropriate stimulus activates the mind's capacity for forming them.)
45. There are certain passages—for example, at the beginning of Meditation V—where Descartes appears to be suggesting that the ideas of *res extensa* and its parts are derived from the mind itself, on the grounds that that the intelligibility of these ideas indicates they are natural to reason. this is obviously a line of reasoning at cross purposes with that of the *Comments,* according to which *confused* ideas of sense have the strongest claim to innateness. It may not be at cross purposes, however, with the argument of Meditation VI that the sensory ideas of bodies come from bodies. One might speculate that Descartes's position about the origin of the idea of matter ultimately combines two elements: while the intelligibility of the idea of matter indicates it is "natural" to reason, one's disposition under circumstances of sense pérception to believe that this idea, and/or the ideas of particular bodies, come from without is also to be relied on. In the latter circumstances, that is, the idea or ideas do "come from without" even though adequate resources to think them up are also independently present in the mind. (Schmaltz, in "Descartes on Innate Ideas," discusses at length the problem of reconciling Descartes's various statements about where ideas of sense "come from.")
46. To Mesland, May 2, 1646: AT IV, 113; K 148. As Descartes indicates in *The Passions of the Soul* and related correspondence, a state of the soul is a passion if it arises through bodily causation, independently of volitional action. See, e.g. AT IV, 310; K, 178 (to Elizabeth, Oct. 6, 1645); and Loeb, *Descartes to Hume,* 152.
47. One may also wonder about how the equation of what is involuntary with what "comes from without" is to be reconciled with Descartes's indication in the *Meditations* that all ideas can, from one point of view, be regarded as mental "operations." (This distinction between voluntariness and mental causation is also discussed by Schmaltz in "Descartes on Innate Ideas.")
48. Cf. Geuroult, *Descartes selon l'order,* Vol. II, 101–02. It is worth noting that when Descartes talks of ideas of bodies "coming from" bodies, he appears mainly to have in mind their origins in the *objects* of perception, rather than the brain states that proximately (so to speak) stimulate the mind.

    I assume, incidentally, that passages which stress the *sufficiency* of cerebral motions to excite, or bring about, sensory ideas in the mind *need* not be read as conflicting with the position presented in the *Comments.* For presumably the former passages may be taken to mean only that motions in the brain are the only *bodily* cause of sensation (ruling out, in particular, scholastic "species"). Of course, to the extent that the passages in question suggest that, given certain bodily motions, sensory ideas result *inevitably,* and to the extent that such inevitability is inconsistent with mental activity (because incompatible with volitional control), they do suggest a problem which ties in closely with the one discussed in the text.

49. See the passage from *Principles* II.1 quoted above. In the French version (AT IX–2, 64), we find the following phrasing: *"l'idée [de la matiere] se forme en nous a l'occasion des corps de dehors . . ."*
50. Cf. *Dioptrics*, Discourse IV, AT VI, 113; CSM I, 165–66.
51. In the *Dioptrics*, Descartes holds that perceptions of such qualities as size and distance require reasoning and judgment. It follows (again) that such ideas cannot come from without—and it even seems to follow that they somehow depend on the will (since, on Cartesian theory, judgment depends on the will)!
52. My conception of the problem of reconciling Descartes's position in the comments with the "passivity" claims has been influenced by correspondence with Paul Hoffman—though I believe our views of the matter may still be rather different.
53. Yolton, in so far as he stresses the natural "sign" conception of the body-mind relation in Descartes's writings, may be said to take note of it. (For, as explained below, the suggestion that the brain gives the mind signs appears to be a version of the presentation conception.) But he certainly fails to consider intelligibility problems inherent in the conception. Loeb, in correspondence, has expressed the view that the presentation model is merely metaphorical. I consider this suggestion at the end of the section.
54. I do not mean to imply that the use of presentation terminology to describe the body-mind relation in sensation (and imagination) is a novelty with Descartes. (It has been pointed out to me that it occurs in various works of Augustine, for instance.)
55. AT VII, 88; CSM II, 60.
56. For a perception is a thought, and thought is just "that which is in us in such a way that we are immediately conscious of it" (RO II: AT VII, 160; CSM II, 113). For a discussion of this issue and more references, see M. D. Wilson *Descartes,* 152 ff.
57. One might propose that for Descartes the sensation just is the consciousness of the brain state that excites it—a *confused* consciousness, to be sure. It seems to me, however, that Descartes talks of sensations arising in the mind *in response to* the mind's receiving a sign from the brain; in other words, having the sensation is treated as a *sequel* to the mind's "noting" the brain motion, or receiving a sign, not as the *same* event.
58. As Louis Loeb has maintained in correspondence.
59. The latter is found in the *Dioptrics* (Discourse VI); I discuss it below.
60. It might be questioned whether Descartes's ridicule of the idea that there are *other eyes in the brain* really amounts to the direct ridicule of the presentation model, which suggests only that *the mind* somehow apprehends brain states. It does seem fairly clear, though, that *something* about the notion of perceiving brain states struck Descartes as bizarre at the time he was writing this passage.
61. "The 'Scandal' of Cartesian Interactionism," 25–26.
62. *From Descartes to Hume,* 137.
63. See, for instance, Meditation VI: AT VII, 88; CSM II, 60-61; cf. Wilson, *Descartes,* 208–09.
64. *Descartes to Hume,* 137.
65. Here I give the passage in Kenny's translation (K 210), which Loeb uses—except that I translate *induissent* as "induce" (as I did above) rather than "impel." The latter translation makes the passage look even less Humean than the former!

    "The nature of the mind" figures in Descartes's account of body-mind interaction elsewhere as well: cf. AT VIII–1, 320; CSM I 184 (PP IV 197); AT XI, 143; H. 36–37.
66. *Treatise of Human Nature,* ed. L. A. Selby-Bigge (Oxford: Clarendon Press, 1888) 155; 170.
67. Notoriously, Descartes says that the mind operates primarily at the pineal gland: thus, he does seem to ascribe to the mind as a whole the capacity for location in ordinary physical space. But the mind is not supposed to be, strictly, extended; so it seems that

if the modes of mind—such as sensations—themselves have location, they must all have precisely the *same* location. This is, to say the least, a difficult notion to grasp.

68. This is, roughly, the move made by Hume himself in a little noted section of the *Treatise* (I, iv, 5: 235–39; 246–50).

    Loeb calls attention to Hume's use, in this section, of his view that "any thing may produce anything" to deny that there is any particular conceptual problem about mind-body causation (cf. *Descartes to Hume*, 361–62). Hume's dropping of the spatial contiguity condition in this discussion does, however, appear to be an *ad hoc* move that requires some reconciling with his earlier account of causal relations. (In this later section, Hume indeed writes as if causation and *temporal* "contiguity" are wholly distinct relations [p. 237].)

69. Loeb has ingeniously developed this notion in correspondence.

70. Some scholars have argued that Descartes did not really think of bodies or physical events as causes *at all*. See, for instance, Gary C. Hatfield, "Force (God) in Descartes' Physics," *Studies in the History and Philosophy of Science* 10 (1979): 113–40; and Daniel Garber, "Understanding Interaction: What Descartes Should Have Told Elisabeth," *Southern Journal Of Philosophy* 21 (Supplement, 1983): 15–32. Garber particularly (if parenthetically) connects this position to the problem of body-mind causation (ibid., p. 26). The evaluation of their claims depends to a large degree on how, exactly, one understands the term 'cause', and on whether *causal efficacy* requires either physical *dynamism* or mental *action* (as opposed, say, to mere transfer of motion). My own view is that there is plenty of evidence—some of it cited in this paper—that Descartes did regard physical states as causally efficacious, despite his assumption that God's concurrence is necessary for the continuation of being presupposed by causality. In any case, my concern here has been only with the question whether, and in what ways, Descartes encounters *special* problems in postulating *body-mind* causation.

[20]

UNDERSTANDING INTERACTION: WHAT DESCARTES SHOULD HAVE TOLD ELISABETH

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A typical text-book account of the philosophy of mind in the 17th Century goes something like this. Descartes believed in two kinds of stuff, mental stuff and material stuff, substances distinct in nature that go together to constitute a single human being. But Descartes also took it for granted that these two substances were capable of genuine causal interaction, that minds can cause bodily events, and that bodies can cause mental events, i.e., that acts of will can genuinely cause changes in the state of the human body, and that the state of the sensory organs and the brain can cause sensation and imagination in the mind. But, the story goes, Descartes went astray here and vastly underestimated the philosophical problems inherent in his position. Descartes, it is claimed, repressed, or even worse, simply ignored the central question his position raises: how is it even possible that an immaterial substance, like the mind, could conceivably act on an extended substance like the human body? According to the standard account, later philosophers recognized the inherent unintelligibility of Descartes' position and started one of the largest cottage industries in the history of philosophy, the attempt to provide satisfactory solutions to the mind-body problem, intelligible accounts of how mental and physical events are related to one another. Realizing the unintelligibility of the doctrine of causal interactionism, this cottage industry produced such noteworthy products as occasionalism, dual-aspect theory, pre-established harmony, and so on, all in the attempt to fill in the gap in Descartes' dualist program.[1]

This general outline can (and has) been challenged; the actual history of philosophy is much richer than any of its rationalized reconstructions. Sympathetic commentators usually call attention to an important pair of letters that Descartes wrote to the Princess Elisabeth in 1643,[2] where Descartes takes up just this question, the intelligibility of mind-body interaction, and offers a philosophically interesting and sophisticated account of why he thinks that the notion of mind-body interaction is perfectly intelligible on its own terms, and why it neither needs nor admits of clarification.[3]

Now, the letters to Elisabeth are carefully thought out responses to the very questions that troubled later philosophers about Descartes' view, and as such, they deserve careful study. But there is a curious difficulty in using these letters as the key to Descartes' position. No one seems to have noticed that Descartes is just not *entitled* to the answer he gives Elisabeth; despite Descartes' clear endorsement, the answer he gives Elisabeth is blatantly inconsistent with other well entrenched aspects of the Cartesian system.

The defense of this claim will be the central task of this paper. I shall begin with an exposition of the account Descartes gives of mind-body interaction in the letters Descartes wrote to Elisabeth in May and June of 1643, letters that form the first line of defense for Descartes' interactionism among those commentators who are committed to defending Descartes' position. After a short digression on a curious analogy Descartes makes between his position and the Scholastic account of heaviness and free fall, I shall examine Descartes' answer to Elisabeth in some detail, and argue that it is inconsistent with the foundations Descartes gives to his theory of motion. Finally, I shall attempt to sketch out an answer that Descartes *could* have given to Elisabeth in 1643, an answer that seems both philosophically interesting, and consistent with the rest of his writings.

Before entering into the argument proper, though, I would like to make a few prefatory remarks concerning the issues I intend to take up, and the issues I don't. The issue that I intend to focus on is that of the *intelligibility* of mind-body interaction. The issue is, admittedly, a fuzzy one, as fuzzy as the notion of intelligibility itself. But historically speaking, it is an important one, as the reaction of Descartes' contemporaries and successors shows. To make the question a bit more precise, I shall construe it, as Descartes and his contemporaries often seemed to do, as the problem of whether the notion of mind-body interaction is somehow intelligible on its own terms, or whether its intelligibility requires an explication, analogy, or analysis in terms of some other distinct variety of causal interaction, itself more basic, or, at least, better understood. To be more precise still, given the prominence of the notion of impact in the then modish mechanistic world view, the question of the intelligibility of mind-body interaction quickly becomes a question of whether mind-body interaction can be understood without somehow relating it to the way in which bodies cause changes in one another through impact.[4] The question of intelligibility should be distinguished from the closely related question of whether or not the mind and body do, as a matter of fact, *actually* interact with one another. Though Descartes and his correspondents and critics often link the two questions for obvious reasons, they are really somewhat independent. One can hold that despite the intelligibility of mind-body interaction, minds and bodies do not, as a matter of fact interact with one another. Philosophically, some reason must be given over and above the bare intelligibility of interactionism for adopting that position. Descartes does have an answer to this question, and an interesting one: it is experience, he claims, "the surest and plainest everyday experience,"[5] as he writes to Arnauld, that convinces us of the truth of interactionism. But as important as this question is, it will not interest me here. My concern will be with bare intelligibility.

Even more specifically, my main focus will be the bare intelligibility of the causal link in only one direction. Descartes' interactionism has two aspects: the mental causation of bodily events (volition) and the bodily causation of mental events (sensation and imagination). While both aspects are important, I shall be concerned mainly with the former, mind-body rather than body-mind causation. In part this is to narrow the range of the discussion. But more importantly, the account of body-body causation that, I shall argue, runs through Descartes' writings on physics makes it, to my mind at least, virtually impossible to understand how he conceived of body-mind causation. The reasons for this will become clearer as the argument progresses, I hope, and I shall point them out when the time comes. But this is an issue that I would like to sidestep in this paper.

And finally, there is one last issue I would like to sidestep. It will become apparent that mind-body interaction is closely connected with the question of the *unio substantiale*, as Descartes called it, the substantial or real union between the mind and body. As a consequence of this doctrine, strictly speaking, one should not talk about a *causal interaction* between two different things, a mind and a body; one should talk about the *causal explanation* of certain behavior or states of a *single thing*, the mind-body union, in terms of mental acts of will or the physical states of the body.[6] But while I recognize that an understanding of Descartes' doctrine of the *unio substantiale* is important to a full understanding of Descartes' position on sensation and voluntary action, I shall try as much as possible to avoid this tangled issue. And, consequently, I shall follow Descartes' usual practice, and that of his correspondents, and consider the problem as one of making intelligible the *interaction* between two substances.

1. The Doctrine of the Three Primitive Notions

Any attempt to come to terms with Descartes' thought on mind-body interaction must begin with a few short letters exchanged between Descartes and the Princess Elisabeth, the most explicit discussion of the problems raised by Descartes' interactionism in the corpus of his writings. The exchange begins with a question Elisabeth raises. She asks Descartes to explain:

> . . . how the mind of a human being can determine the bodily spirits [i.e., the fluids in the nerves, muscles, etc.] in producing voluntary actions, being only a thinking substance. For it appears that all determination of movement is produced by the pushing of the thing being moved, by the manner in which it is pushed by that which moves it, or else by the qualification and figure of the surface of the latter. Contact is required for the first two conditions, and extension for the third. [But] you entirely exclude the latter from the notion you have of the body, and the former seems incompatible with an immaterial thing.[7]

Or, as Elisabeth put the question when, unsatisfied with Descartes' first answer, she wrote for further clarification:

> And I admit that it would be easier for me to concede matter and extension to the mind than it would be for me to concede the capacity to move a body and be moved by one to an immaterial thing.[8]

The problem Elisabeth has is an obvious and understandable one; she finds it impossible to conceive of how a non-extended mind can cause changes in an extended body. On the other hand, she finds the mechanist's conception of how one body can change the motion of another body at least reasonably unproblematic. There appears to be no mystery for Elisabeth with the phenomenon of impact that constitutes the basic concept in a mechanist physics like Descartes' own. What she seeks is some connection between the two domains, a way of understanding the seemingly incomprehensible mechanism of mind-body interaction in terms of the relatively more intelligible phenomenon of body-body interaction.

Descartes' reply is reasonably clear. Put briefly, Descartes denies that the mechanical explanation of change in terms of impact is relevant to the question as to how mind acts on the body. The claim is that we have a special notion in terms of which we understand mind-body interaction, a notion distinct from the notions in terms of which we understand things that pertain to the mind or to the body taken separately. Descartes argues as follows in his first reply to Elisabeth:

> First I observe that there are in us certain primitive notions which are, as it were, the originals on the pattern of which we form all of our other thoughts . . . First, there are the most general ones, such as being, number, and duration . . . . Then, as regards body in particular, we have only the notion of extension, which entails the notions of shape and motion; as regards mind in particular, we have only the notion of thought, which includes the conceptions of the intellect and the inclinations of the will. Finally, as regards the mind and body together, we have only the notion of their union, on which depends our notion of the mind's power to move the body, and the body's power to act on the mind and cause sensations and passions. I observe next that all human science consists solely in clearly distinguishing these notions and attaching each of them to the things to which it applies. For if we try to solve a problem by means of a notion that does not apply, we cannot help going wrong. Similarly, we go wrong if we try to explain one of these notions by another, for since they are primitive notions, each of them can only be understood by itself. The use of our senses has made the notions of extension, shape, and movement more familiar to us than the others; and the main cause of our errors is that we commonly want to use these notions to explain matters to which they do not apply. For instance, we try to use our imagination . . . to conceive the way in which the mind moves the body after the manner in which one body is moved by another. . . . So I think that we have hitherto confounded the notion of the mind's power [*force*] to act on the body with the power one body has to act on another.[9]

Descartes' full answer to Elisabeth is what might be called the doctrine of the three primitive notions. General notions aside, we have within us three basic ideas, that of mind, that of body, and that of their union. Each is separate, each is distinct, and each has its own domain of application; each is *per se* intelligible, and cannot be explained in terms of other primitive notions. Elisabeth's mistake is that of trying to explain one notion, that of mind-body interaction, which pertains to the primitive notion of the union of mind and body, in terms of impact, which pertains to another primitive notion, that of extension or body, something that is neither necessary, since each notion is *per se* intelligible, nor possible, since the notions are completely distinct. Mind-body interaction can be grasped only by grasping the unity of mind and body. Since the primitive notion of mind-body unity is made "familiar and easy to us" only through the senses, Descartes recommends that the young Princess *abstain* from philosophy, and re-enter everyday life.[10] We *have* a notion that is *per se* intelligible in terms of which to understand interaction, and if anyone, like Elisabeth (or Arnauld, or Gassendi, or More, or Regius . . .) fails to see this, it must be because their minds are confused and cluttered. What is called for is a bit of therapy, not argument or explanation. Go about your daily life, and you will find the appropriate notion, just as the unreflective man in the street does.

This is how Descartes tries to explain himself. It can, admittedly, look somewhat suspicious, as if Descartes is simply declining to deal with a serious problem, claiming to understand something that is just unintelligible. Worse than that, Descartes looks as if he is patronizing the sincere but penetrating young Princess who, many later readers have judged, actually got the better of the older and more distinguished Descartes in this exchange.

But I don't think that this is fair. I agree with Descartes' sympathetic commentators in seeing Descartes as offering a philosophically sophisticated answer to Elisabeth's serious question. The doctrine of the three primitive notions is an interesting and not implausible claim about what is going on in the mind, about our native endowments. It is, furthermore, a claim that coheres well with the epistemology and account of our mental faculties that Descartes already worked out in the unpublished *Regulae* and the then recently published *Meditations.*

Descartes' answer is a philosophically serious answer. While it may not ultimately hold up under philosophical scrutiny (what answer to what problem, alas, has?), it cannot be dismissed as begging the question or patronizing the questioner. On this much I agree with a number of friends of Descartes. But the defense of the intelligibility of Cartesian interactionism cannot end here. For the answer Descartes gave to Elisabeth, while interesting and, perhaps, defensible, is flawed in an important way; it is, I claim, *not* the answer that should have been offered by the author of *Le Monde* and the *Principia.*

II. The Heaviness Analogy

Before making good on my claim, though, I would like to digress for a few pages, and point out one comparison that Descartes *does* think illuminates the account of mind-body interaction, a comparison that involves the Scholastic account of free fall or heaviness. In part, I want to deal with an obvious question that this raises: how is this comparison different from the one that Elisabeth suggests? How is the use of this comparison consistent with Descartes' apparent claim that comparisons can be of no use in illuminating mind-body interaction? But in addition to dealing with these questions, I want to point out something that this discussion of Descartes' suggests, a way of looking at Descartes' conception of mind-body interaction that will be helpful in understanding the account of that notion that, I shall argue, better suits Descartes' system than the one he offered.

On the Scholastic account of heaviness, at least as Descartes understood it, the heavy body is impelled to the center of the Earth by the *real quality* of *heaviness*, something distinct from the body itself, something incorporeal.[11] This account, which Descartes thinks is intelligible and generally understood,[12] can be helpful in getting his correspondents to understand his conception of mind-body union and interaction. Thus, Descartes writes to Elisabeth:

> . . . When we suppose that heaviness is a real quality of which all we know is that it has the power [*force*] to move the body that possesses it towards the center of the earth, we find no difficulty in conceiving how it moves the body nor how it is united to it. We do not suppose that the production of this motion takes place by a real contact between two surfaces, because we experience in ourselves that we have a specific notion to conceive it by. I think that we misuse this notion when we apply it to heaviness, which as I hope to show in my physics [i.e., the yet to be published *Principia Philosophiae*], is not anything really distinct from body; but it was given us for the purpose of conceiving the manner in which the mind moves the body.[13]

It is important here to appreciate the difference between the analogy that Descartes appeals to, and the comparison Elisabeth makes between mind-body and body-body interaction, a comparison that Descartes rejects. Descartes' criticism of Elisabeth is that she is attempting to understand *one* primitive notion in terms of *another*, something that can only lead to grief. But the situation is altogether different with the Scholastic analogy to which Descartes appeals. As Descartes claimed in his reply to the *Sixth Objections*, in a passage to which he calls Elisabeth's attention, the common idea of heaviness, the idea the Scholastics and the common man and the idea that Descartes himself had in his naive and sense-bound youth, is, in fact, *derived* from the idea we have of mind. Descartes writes:

> . . . The chief sign that my idea of heaviness was derived from that which I had of the mind is that I thought that heaviness carried bodies toward the center of the earth as if it contained some cognizance [*cognitio*] of this center within it. For it could not act as it did without such cognizance, nor can there be any such cognizance except in the mind.[14]

Thus, Descartes can claim, as he did to Elisabeth in the passage I quoted earlier, our notion of how the real quality of heaviness acts on the body to which it is attached must be derived from the notion we have of how the mind acts on the body. Now, since Descartes assumed that his readers were conversant with the Scholastic account of heaviness, he thought that he could use this familiar doctrine to call his skeptical readers' attention to the notion of mind-body union and interaction, and point out that, despite their claims of not being able to conceive how an incorporeal mind could act on an extended body, they really do have the notion in question. This is what he explained to Arnauld, to whom he offered the same analogy in 1648, five years after the letters to Elisabeth:

> So, it is no harder for us to understand how the mind moves the body than it is for them [i.e., the Scholastics] to understand how such heaviness moves a stone downwards.[15]

Whether or not this explanatory device was successful,[16] it is clear that Descartes is entitled to use it. Unlike the comparison Elisabeth presses, the comparison between mind-body causation and mechanical causation, in Descartes' comparison there is no real analogy, no comparison between two *different* notions. Rather, Descartes claims, there is an *identity*: the *same* notion, that of mind-body union and interaction is at issue in both contexts. Only in one of those contexts it is misapplied.

This is all a fairly straightforward and unproblematic exposition of what Descartes was up to, of why Descartes thought the analogy drawn from Scholastic science was helpful, and, unlike the analogy Elisabeth tries to draw from mechanist science, unproblematic. But I would like to point out an interesting aspect of Descartes' use of the heaviness analogy. The account that Descartes gives of the Scholastic theory of heaviness makes the primitive notion of mind-body unity and the correlative notion of mind-body interaction *conceptually basic* in an extremely interesting sense. Descartes' claim is that the Scholastic scientist is just projecting his innately given conception of his own composite nature onto the inanimate world[17]; *unless* the Scholastic scientist had this primitive notion pertaining to the union of mind and body, he couldn't understand the explanations he gives of phenomena in the inanimate world. That is, as Descartes understands it, our comprehension of Scholastic explanations in terms of substantial forms and real qualities is *parasitic* on the notions we have of mind-body unity and interaction. The notion we have of the interaction between mind and body is a kind of *paradigm notion*, a notion that is intelligible on its own terms (i.e., through the closely related notion of mind-body unity), but one in terms of which at least some other seemingly distinct varieties of causal explanation are intelligible. Two things are worth noting about this paradigm. For one, it should be pointed out that though mind-body interaction is a paradigm with respect to Scholastic explanations, Descartes is unambiguous in thinking that Scholastic explanations in terms of forms and qualities are *bad* explanations. The Scholastic projection of mind and mental activity onto the material world is an *illicit* projection, in Descartes' judgment. And second, and more importantly, it should be noted that although mind-body interaction is *a* paradigm for causal explanation, it is not the *only* paradigm, it is not universally applicable. There are, Descartes seems to claim in his reply to Elisabeth, *some* causal explanations, those that involve the mechanical interactions of bodies with one another, that *cannot* be understood through our understanding of mind-body interaction; our understanding of voluntary action in animate beings can no more clarify mechanical explanations than *vice versa.* Or so, in any case, Descartes tells Elisabeth.

III. Motion, Impact, and God

Let us return now to the main thread of my argument. In §I I presented Descartes' answer to Elisabeth's worries about the intelligibility of mind-body interaction. However, I suggested there that there is something radically wrong with the answer that Descartes gave Elisabeth; it is an answer, I claim, that goes against some of Descartes' most deeply held beliefs about the foundations of physics. Now I must make clear just what I have in mind.

I would like to begin by focusing in on the comparison Elisabeth attempts to draw between mind-body interaction and body-body interaction, i.e., impact. Elisabeth finds body-body interaction perfectly intelligible. What she is asking Descartes, in effect, is to explain the one in terms of the other; she wants Descartes to explain how a non-extended and incorporeal mind can *literally* make contact with and impel an extended body. Descartes' answer is to say that body-body and mind-body interaction are both intelligible, but on their own terms, that each must be comprehended through its own primitive notion, body-body interaction through the notion of extension, and mind-body interaction through the notion of the unity of mind and body.

Let us examine these claims of Descartes'. Since we are dealing with claims that relate to primitive notions and the notions that derive from, are comprehended through, fall under, etc., these primitive notions, we must first inquire into how it is that the primitive notions are related to the less primitive notions that fall under them. Descartes, if you remember, characterizes the relation as follows:

> First I observe that there are in us certain primitive notions which are, as it were the originals [*comme des originaux*] on the pattern of which [*sur le patron desquels*] we form all of our other thoughts [*connoissances*].[18]

Descartes is none too clear in this passage. But at very least, I think that Descartes means to say that if a given idea Q falls under a primitive notion P, then having P is in some sense necessary for having Q, and that no primitive notion distinct from P is necessary for having Q. P is the original of and pattern for Q in at least this minimal sense.

The problem I see with Descartes' answer to Elisabeth relates to the claims that he seems to make about precisely what ideas fall under the primitive notions he enumerates. Now, it is tempting to suppose that the real problem must arise in connecting mind-body interaction to the primitive notion of mind-body unity that Descartes claims we have, to suppose that Descartes' answer must break down there if it breaks down anywhere at all. But this is not what worries me. Although Descartes' conception of mind-body unity has its obscurities, I am reasonably confident that one can concoct a plausible account of mind-body unity that makes comprehensible just why Descartes saw mind-body interaction as falling under the primitive notion of mind-body unity.[19]

I certainly concede that working out this account may involve Descartes in some unforseen difficulties. But be that as it may, the obvious problems lie not with unity and interaction, but with the *prima facie* more plausible account of the idea of body-body interaction as it relates to the primitive notion of extension. Descartes' answer *seems* to suggest that impact, body-body interaction falls under the primitive notion of extension. But does it?

In answering Elisabeth, Descartes gives only two examples of ideas that derive from the primitive notion of body: shape and motion. It is clear why shape is included there. Shape is a *mode* of extension, in Descartes' technical vocabulary.[20] And it is plausible to suppose that we cannot have an idea of a mode, like shape, without having an idea of the kind of substance of which it is a mode, i.e., extended substance, and that no *other* idea is required for us to be able to have an idea of shape. That is, the idea of shape falls under the primitive notion of extension in the appropriate sense.

The same case can be made for the idea of motion. Though there are some complexities here, Descartes was clear in considering motion to be a mode of body, a mode of extension, just like shape. Descartes wrote in his *Principia* in offering a formal definition of the notion of motion:

> . . . If we consider how motion must be understood . . . in accordance with the truth of the matter, we must say that it is the translation [*translatio*] of one part of matter, or of one body from the vicinity of those bodies which immediately touch it and which are regarded as being at rest, into the vicinity of others . . . And I say . . . strictly speaking that it is a mode [of body], not something substantial, just as shape is a mode of a thing with shape, and rest is a mode of a thing at rest.[21]

Similarly, Descartes wrote to Henry More:

> The translation that I call motion is a thing of no less entity than shape: it is a mode in a body.[22]

Consequently, one can say that motion is understood through the primitive notion of extension in roughly the same way as shape is.[23]

But, it should be noted, Elisabeth's question *didn't* deal with motion *per se*. The comparison she is attempting to press is not a comparison between mind-body interaction and *motion*, i.e., the translation a body undergoes with respect to other bodies, but between the way in which a *mind* can cause motion in bodies, and the way in which *bodies* can cause motion in other bodies. That is, the comparison is not between interaction and motion, but between two purported ways of *causing* motion. And while motion itself may be a mode of body, something comprehended through the notion of extension, change in motion and its causes are something altogether different.

Now, how *are* we to understand body-body interaction, the way in which one body can change the speed or direction of another body's motion through impact? Elisabeth takes this to be intelligible in and of itself and to be in need of no further explanation. And although Descartes *seems* to concur with this in his answer to her, quite a different answer emerges from his more careful writings on physics from early to late. A way into Descartes' position is through the question: what are the laws that govern the behavior and interaction of bodies, and why do bodies obey the laws they do? One might, as some of Descartes' contemporaries tried to do, answer this question either through empirical studies[24] or through an analysis of the nature of body and motion.[25] But for Descartes, the laws that govern bodies in motion and impact must derive from the *causes* of motion.

But what *are* the causes of motion for Descartes? Descartes answers this question in very general terms in a letter to More that I quoted earlier. Descartes writes:

> The translation which I call motion is a thing of no less entity than shape: it is a mode in body. The force causing motion [*vis . . . mouens*] may be that of God himself conserving the same amount of translation in matter as He put in it the first moment of creation; or it may be that of a created substance, like our mind; or of any other thing to which He gave the force to move a body.[26]

The causes of motion, then, are God, or minds.[27] Now, the mental causation of motion is something of great importance to Descartes, as we have seen already. But in physics, it is the *divine* causation of motion that is mostly at issue. And it is from an understanding of how God causes motion that the laws of motion are derived.

Descartes begins his discussion of the causes of motion and the laws it obeys with the following statement:

> After having considered the nature of motion, we must consider its cause, and that is twofold: first, indeed the universal and primary cause, which is the general cause of all motions in the world; and then the particular cause, by which it happens that individual parts of matter acquire motions which they did not have before. And it seems obvious to me that the general cause in question is nothing else but God himself.[28]

The distinction between the universal and particular causes that Descartes announces here makes it look as if Descartes is dealing with a distinction between a prime-mover God who is the first cause, setting the world in motion, and other corporeal causes, which result in the world changing from moment to moment. But this is not the picture at all. The universal and general cause, God, not only sets the world in motion, but *preserves* motion in the world; the secondary causes to which Descartes refers, as it turns out, are not causes of motion over and above God, but rather three laws in accordance with which God Himself preserves motion in the world from moment to moment.

In order to understand just how this works, we must remember that for Descartes, the world must be preserved from moment to moment by God, if it is not to pass out of existence. But since preservation and creation are the same thing, Descartes argues, this is to say that God must continually recreate the world for it to persist.[29] So, Descartes' God is not merely the prime mover; He is the general cause of motion insofar as it is His continual activity, His changing of the relative places of bodies from moment to moment while keeping them in existence that *constitutes* motion in the world.[30] Consequently, the laws that bodies in motion obey must derive from the way in which God continuously recreates the world. And this, indeed, is just how Descartes derives those laws. The first general principle Descartes notes is his famous conservation of motion law. This law is derived from the immutability of God. Descartes argues that:

> We must understand God to be perfect not only insofar as he is immutable, but also insofar as he works with the greatest constancy and immutability . . . . Whence it follows that it is most consistent with reason that we think that from this alone, that God moved the parts of matter in different ways when He first created them, and now conserves all that matter in the same way and for the same reason He created it before, that He would also conserve the same amount of motion in it always.[31]

This is Descartes' "master law" of motion. But the secondary laws are also derived, as the master law was, from God's activity. Descartes writes:

> And from this same immutability of God, certain rules or laws of nature can be understood, which are secondary and particular causes of the different motions which we notice in individual bodies.[32]

The dependence of the first two of the secondary laws on God's immutability as a cause of motion is evident. These laws, the so-called Cartesian laws of inertia (laws of persistence would be more accurate) mandate that certain states in bodies, the state of motion itself in the first law, and the state of moving in a particular direction in the second, persist. These follow directly from the immutability of God, who Descartes writes, "perserves motion precisely as it is in that very moment of time in which he conserves it."[33]

The third law, the law dealing with impact and the way in which one body can change the state of another body, is somewhat more difficult. In order to continue the argument, Descartes must argue that the *immutability* of God requires that He *change* the motion of a given body under certain circumstances, when, for example, it is hit by another body of appropriate size and speed (force of going on). And this, indeed, is how Descartes argues. The intuition is this. The fact that there is no space devoid of body,[34] together with the fact that God created a world of bodies in motion[35] entails that if God is to preserve motion in the world, as His immutability requires, He *must change* the motion of at least some bodies as they encounter one another. Thus Descartes writes in the *Principia*, in defense of his law of impact:

> All places are filled with body, and at the same time the motion of every body is rectilinear in tendency; so clearly, when God first created the world, He must not only have assigned various motions to its parts, but also have caused their mutual impulses and the transference of motion from one to another; and since He now preserves motion by the same activity and according to the same laws, as when He created it, he does not preserve it as a constant inherent property of given pieces of matter, but as something passing from one piece to another as they collide. Thus the very fact that creatures are continually changing argues for the immutability of God.[36]

Descartes' reasoning here is hardly the model of clarity and distinctness. But at least this much is clear: for Descartes, impact and the changes in bodily motion that result from impact are nothing but the changes that *God* must make in recreating the world from moment to moment in order to accommodate the motion of bodies to one another. Strictly speaking, *bodies* in motion are *not* real causes of change in impact, it would appear; motion transferred, motion begun, and motion ended in impact must derive from God himself, shuffling bodies about as part of the process of "conserving the same amount of translation in matter as He put in it the first moment of creation," as he wrote to More.[37]

(Here, by the way, is the reason why body-mind causality must be problematic for Descartes, as I suggested earlier. The picture one gets from the physics is one of inert matter being shuffled around from moment to moment by an active God and, from time to time, by active incorporeal minds. But given the inertness of matter on this picture, in what sense can one say that the body can cause changes in mental stuff?)

The discussion of the last few pages has taken us a bit out of our way. I started with the claim that Descartes *seems* to make to Elisabeth, that body-body causation must be understood through the primitive notion of extension. I claimed that while this may be true of motion *simpliciter* which is, indeed, a mode of body, the case of body-body interaction or impact is more complex, at least as analyzed in Descartes' writings on physics. An account of impact led us from motion *simpliciter* to its causes, to God and the way in which He acts on the world in shuffling bodies about from moment to moment. So, it seems, a full understanding of body-body interaction requires that we understand not only motion, a mode of extension, but the way in which God acts on the world. But under which of Descartes' three primitive notions does *this* fit?

Descartes never takes this question up in quite those terms. But a very similar question does arise in the all too brief correspondence with More at the end of Descartes' life. One of More's deepest criticisms of Descartes concerns the doctrine that the essence of material substance is extension. More argues that material substance is not mere extension, but *tangible* or *impenetrable* extended stuff. As part of his attack, More makes the claim that spirits and even *God* are extended.[38] In the case of

God, More argues:

> Now, the reason why I judge that God is, in his way, extended is that He is omnipresent and intimately fills the whole machine of the universe and each of its individual parts. For how could he imprint motion on matter, which He once did, and which He actually does now, according to you [i.e., Descartes], unless He now as it were touches the matter of the universe, or at least once did? . . . God is thus in his way extended, and consequently, God is an extended thing.[39]

Descartes' answers to More's general attack are quite interesting, and bear interesting relations to his responses to Elisabeth's general worries about how incorporeal substances can move extended bodies.[40] But most interesting is his answer as to how we can conceive of an non-extended God as being able to act on an extended world. Descartes writes:

> It is no disgrace to a philosopher to believe that God can move a body, without regarding God as corporeal; it is no more of a disgrace to him to think the same of other incorporeal substances. Of course I do not think that any mode of action [*modus agendi*] belongs univocally to both God and creatures, but I must confess that the only idea I can find in my mind to represent the way [*modus*] in which God or an angel can move matter is the one which shows me the way in which I am conscious I can move my own body by my own thought.[41]

This comes as close as one could like to answering my question. The way God acts upon the world in sustaining motion and rearranging bodies in impact must, it seems, be derived from the conception I have of how I act upon my body; it, too, must be derived from the primitive notion of the unity of mind and body. Descartes' answer to Elisabeth, thus, cannot have been the *correct* answer, the answer that he should have given, on his own principles. Body-body interaction is *not* fully intelligible under the primitive notion of extension. A full understanding of bodies in impact, of how one body can alter the motion of another requires that we understand how God acts on the world. And this, in turn, requires that we be familiar with the way our mind acts upon our bodies. So, if there is something wrong with the comparison that Elisabeth tries to draw between mind-body and body-body interactions, it cannot be what Descartes says it is; it cannot be an illicit intermingling of discrete primitive notions. For the *same* primitive notion is ultimately involved with *both*.

IV. What Descartes Should Have Told Elisabeth

The argument of the previous section undermines Descartes' answer to Elisabeth. Elisabeth's attempt to understand interaction through impact is *not* wrong for the reason Descartes says it is; Elisabeth is *not* confusing concepts that fall under different primitive notions. This much is clear. But the most interesting question still remains to be faced: how does this observation affect the claim for which Descartes is trying to argue? In responding to Elisabeth, Descartes is attempting to establish that mind-body interaction is *per se* intelligible, or, at least, intelligible through the closely related notion of mind-body unity, and that Elisabeth's attempt to connect mind-body interaction with body-body interaction is neither possible nor needed. I have shown that the argument he offers for these claims through the doctrine of the three primitive notions is not, on Descartes' own terms, correct. But what becomes of the claims themselves? Ironically enough, I think that my Cartesian refutation of Descartes' actual response to Elisabeth, if anything, *strengthens* his position. The considerations concerning motion and impact drawn from Descartes' writings on the foundations of physics suggest a line of defense for the claims in question which is more consistent with the rest of his works than the one he offered to Elisabeth, and which is, I think, philosophically stronger than the one he actually used. I should point out here that I make no claim that Descartes ever used, or even saw the argument that I will try to develop in this section. All I claim is that it is an argument he *could* have used, and perhaps, *should* have used.

Let me begin setting out this new and improved answer to Elisabeth by recalling the earlier discussion of the analogy that Descartes appeals to in explaining his position, the analogy with the Scholastic account of heaviness. I pointed out that what allows Descartes to use that analogy is his claim that in this case we are not dealing with two different notions, but only one. The claim is that the Scholastic account of heaviness is comprehensible because it involves a projection of our composite nature onto the inanimate world. The real quality of heaviness is thought of as a kind of mind, united to the heavy body in just the way that the human mind is united to the human body, and, it is claimed, we conceive of heaviness acting on the heavy body in drawing it to the center of the Earth in just the way we conceive of the mind acting on the body. Thus, the Scholastic mode of explanation is parasitic on the idea we have of mind-body interaction in the sense that if we didn't understand how minds acted on animate bodies, then we wouldn't understand how forms or qualities act in inanimate bodies. Furthermore, one can, perhaps, say that the notion we have of mind-body interaction is a paradigm notion with respect to the Scholastic account of heaviness, and, more generally, with respect to all Scholastic explanations in terms of form and quality, insofar as our understanding of these modes of explanation involves a projection of our notion of mind-body interaction onto the world of inanimate things.

The discussion of motion and impact suggests that something similar can be said about the relation between mind-body interaction and the mechanical conception of explanation in terms of impact. Now, it is true that the notion of mind-body interaction is not a paradigm notion with respect to impact in quite the same way as it is with regard to the Scholastic conception of heaviness. While the notion of mind-body interaction does enter into a *full* understanding of interaction, it is not a *simple* projection of our composite nature onto the inanimate world, as the Scholastic theory is. The notion of mind-body interaction enters in at only the deepest level of analysis of the notion of impact, when we attempt to understand how God, the first and continuing cause of motion in the world, the real cause for the changes in the motion of bodies in impact, can act upon the material world. Consequently, impact cannot be used as Descartes tries to use the Scholastic theory of heaviness, to call attention to the idea of interaction he claims we all have. But, the notion we have of impact *is* like the notion we have of the Scholastic account of heaviness in an important respect. Elisabeth, like most of her contemporaries, at least those sympathetic to the new mechanist science, took impact to be *per se* intelligible, in fact, the very model of intelligibility. What Descartes' analyses of motion and its laws purport to show is that this is not so. A full understanding of motion in the material world requires reference to God and his action on the material world, and through this, requires reference to our mind's action on our bodies. In this way we can say that the notion of impact, like the Scholastic notion of heaviness, is parasitic on the notion we have of mind-body interaction; for impact as for the Scholastics' heaviness, mind-body interaction is a notion without which the notion of body-body interaction is, strictly speaking, unintelligible, despite appearances to the contrary. And though mind-body interaction is not paradigmatic in the easy and obvious way that it is with respect to Scholastic science, a full understanding of body-body interaction requires an appeal to the way our minds can move our bodies.

This suggests an interesting line of defense for Descartes' position on the intelligibility of mind-body interaction. Mind-body interaction seems to be, for Descartes, a paradigm for both mechanist and Scholastic causal explanation. Since these were the two main competitors at the time, we can say that, for Descartes, mind-body interaction is the paradigm for *all* causal explanation, it is that in terms of which *all* other causal interaction must be understood. And in this there lies a defense for the intelligibility of interaction altogether different from the one, based on the doctrine of the three primitive notions that he offered to Elisabeth. Mind-body interaction must be basic and intelligible on its own terms since if it were not, then *no* other kind of causal explanation would be intelligible at all; to challenge the intelligibility of mind-body interaction is to challenge the entire enterprise of causal explanation. Furthermore, we *cannot give* a simpler or more easily understood account of causal interaction than mind-body interaction because *there are no more basic or more inherently intelligible ways of explaining the behavior of anything open to us.* We cannot appeal to analogies with impact to clarify mind-body interaction, as Elisabeth does, not because of any confusion of primitive notions, but because we *must* work the other way: body-body interaction must ultimately be understood through the notion we have of the way in which the mind acts on the body.

I should repeat that, despite suggestions of a position like this in the writings on motion, Descartes never said anything like this, to the best of my knowledge. But it is a philosophically interesting answer, one that is open to him and, I think, more consistent with his conception of causal interaction in the physical world than the account that he actually offered. It is, I think, the way of understanding interaction that Descartes *should* have offered Elisabeth.

ABBREVIATIONS

AG Elizabeth Anscombe, and Peter Geach (eds. and trans.), *Descartes: Philosophical Writings* (London, 1954).
AT Ch. Adam, and Paul Tannery (eds.), *Oeuvres de Descartes* (Paris, 1879-1913 and 1964-1974).
HR Elizabeth Haldane, and G.R.T. Ross (eds. and trans.), *The Philosophical Works of Descartes* (Cambridge, 1911).
K Anthony Kenny (ed. and trans.), *Descartes: Philosophical Letters* (Oxford, 1970, and Minneapolis, 1981)
Pr Descartes, *Principia Philosophiae*. The original Latin version is given in AT VIII-1, and the French translation made under Descartes' supervision is given in AT IX-2. Partial translations are found in AG and HR 1.

References to AG and K are by page number. References to AT and HR are by volume and page. References to Pr are by part and section number. References are always given to the original language first, followed in parentheses by the most accessible translation, when one is available. The translations are sometimes my own, and sometimes borrowed from the sources cited. In all cases, translations from Pr are taken from the Latin version.

NOTES

[1] This standard account dates back to the 17th century. For an account of this reading in the texts of Spinoza, Leibniz, and Malebranche, see, e.g., Jean Laporte, *Le Rationalisme de Descartes* (Paris, 1950), pp. 220-25. Richard Watson discusses similar themes in lesser known Cartesians of the late 17th century in his book, *The Downfall of Cartesianism* (The Hague, 1966). The claim that interaction is the scandal of Descartes' philosophy is still commonplace in the standard commentaries. See, e.g., Anthony Kenny, *Descartes* (New York, 1968), pp. 222-26; and Bernard Williams, *Descartes* (New York, 1978), pp. 287-88.

[2] Descartes to Elisabeth, 21 May 1643, AT III 663-68 (K 137-40); Descartes to Elisabeth, 28 June 1643, AT III 690-95 (K 140-43). Excerpts from these letters along with excerpts from the relevant letters that Elisabeth wrote to Descartes are given in AG 274-82.

[3] For instances of this more sophisticated reading, see, e.g., Jean Laporte, *op. cit.*, pp. 220-54; Henri Gouhier, *La Pensée Métaphysique de Descartes* (Paris, 1962), pp. 321-344; and Robert Richardson, "The 'Scandal' of the Cartesian Interactionism," *Mind* 91 (1982).

[4] There are, of course, other ways in which the question of the intelligibility of mind-body interaction could be raised. One could take it to be a question about how interaction can be reconciled with certain commonsense notions about causality, in particular with the so called "reality principle" (the cause must, in some sense, contain everything that is in the effect), or with the intuition that causal relations can only hold among things that are sufficiently similar. On this question see, e.g., Richard A. Watson, *op. cit.*, *passim*, but especially pp. 33-36; Louis Loeb *From Descartes to Hume* (Ithaca, 1981), pp. 134-43; and chapters I and II of Eileen O'Neill's unpublished Ph.D.

dissertation, *Mind and Mechanism* (Princeton, 1983). Another kind of incoherence involves the question as to how mind-body interaction can be reconciled with a law-governed conception of the material world like Descartes'. On this question see, e.g., Louis Loeb, *op. cit.*, pp. 143-48, and Daniel Garber, "Mind, Body, and the Laws of Nature in Descartes and Leibniz", *Midwest Studies in Philosophy* 8 (1983).

[5] Descartes for [Arnauld], 29 July 1648, AT V 222 (K 235).

[6] For an account of the substantial union of mind and body and some aspects of its relation to the problem of interaction, see e.g., Geneviève Rodis-Lewis, *L'Oeuvre de Descartes* (Paris, 1971), vol. I, pp. 351-365, and the numerous references cited there; and Henri Gouhier, *op. cit.*.

[7] Elisabeth to Descartes, 6/16 May 1643, AT III 661 (AG 274-75).

[8] Elisabeth to Descartes, 10/20 June 1643, AT III 685 (AG 278). Other contemporary critics and correspondents made the same point to Descartes. See, e.g., Gassendi's remarks in his *Fifth Objections*, AT VII 341 (HR II 199-200); Arnauld to Descartes, [July 1648], AT V 215; More to Descartes, 11 December 1648, AT V 238-39.

[9] Descartes to Elisabeth, 21 May 1643, AT III 665-66 (K 138-39). See also Descartes to Elisabeth, 28 June 1643, AT III 691-92 (K 140-41); and Pr I 48 (HR I 238).

[10] This is the general theme of the letter, Descartes to Elisabeth, 28 June 1643, AT III 690-95 (K 140-43).

[11] For an account of the Scholastic theory of form and quality as Descartes understood it, and one of his principal lines of attack against it, see Etienne Gilson's classical essay, "De la critique des formes substantielles au doute méthodique" in his *Etudes sur le rôle de la pensée médiévale dans la formation du système cartésien* (Paris, 1930),, pp. 141-190.

[12] At least he *usually* concedes this. Descartes takes a different position in his letter to Regius, January 1642, AT III 506 (K 129), 507.

[13] Descartes to Elisabeth, 21 May 1643, AT III 667-68 (K 139). Descartes uses similar comparisons in other writings as well. See, e.g., Descartes to Hyperaspistes, August 1641, AT III 424 (K 112); Descartes for [Arnauld], 29 July 1648, AT V 222-23 (K 235-36); and the *Letter of Mr. Descartes to Mr. C.L.R.* [i.e., Clerselier], AT IX-1 213 (HR II 132).

[14] *Sixth Replies*, AT VII 442 (HR II 255).

[15] Descartes for [Arnauld], 29 July 1648, AT V 222-23 (K 236).

[16] We don't know Arnauld's reaction, but the tactic *wasn't* particularly successful with Elisabeth. See Elisabeth to Descartes, 10/20 June 1643, AT III 684 (AG 277-78).

[17] This is exactly parallel to the account Descartes often gives of the common belief that material things are really red, or hot, or sweet. See, e.g., Pr I 66-71 (HR I 247-50).

[18] Descartes to Elisabeth, 21 May 1643, AT III 665 (K 138).

[19] One might even suggest that when Descartes says that mind and body are united, this claim simply *means* that they are capable of appropriate causal interaction. See, e.g., Henri Gouhier, *op. cit.*, p. 335. For a contrary view, that the mind-body union results in a third substance, a substance over and above the mental and material substances that make it up, see, e.g., G. Rodis-Lewis, *op. cit.*, vol. I p. 353 and the references cited in vol. II, p. 543, note 29; or Janet Broughton and Ruth Mattern, "Reinterpreting Descartes on the Notion of the Union of Mind and Body," *Journal of the History of Philosophy* 16 (1978), pp. 23-32.

[20] See, e.g., Pr I 53, 61 (HR I 240, 244-45).

[21] Pr II 25 (AG 209). See also Pr II 27 (AG 210).

[22] Descartes to More, August 1649, AT V 403 (K 257).

[23] Despite what Descartes says, this cannot be quite right, since motion, unlike shape, involves time or, at very least, change.

[24] Though the question is hotly debated, this is at least *one* reading of what Galileo thought he was up to. For this reading, see, e.g., Stillman Drake, *Galileo Studies* (Ann Arbor, 1970), especially Drake's polemical introduction. For Descartes' nutshell assessment of Galileo's physics, see Descartes to Mersenne, 11 October 1638, AT II 380.

[25] This seems to be the strategy Thomas Hobbes adopts, e.g., in *De Corpore*, chapter 15. This is also the strategy that Leibniz sometimes attributed to his own youthful works in physics, the *Theoria Motus Abstracti* and the *Hypothesis Physica Nova*. See, e.g.,

Leibniz's remarks at the time these works were being written, in Leibniz to Oldenburg, 13/23 July 1670, in Leibniz, *Sämtliche Schriften und Briefe* (ed. Preussischen Akademie der Wissenschaften), series II, vol. I (Darmstadt, 1926), p. 59; or Leibniz's later remarks on this early program in part I of his *Specimen Dynamicum* (1695), in G. W. Leibniz (ed. C.I. Gerhardt), *Mathematische Schriften*, vol. VI (Halle, 1860), p. 240, translated in P. P. Weiner (ed.), *Leibniz Selections* (New York, 1951), p. 128. In some of his polemical writings against the Cartesians, Leibniz gives the misleading impression that for Descartes, too, the laws of motion are to be derived from the nature of body. See, e.g., the essay that Weiner has entitled, "Whether the Essence of a Body Consists in Extension," in Leibniz (ed. C. I. Gerhardt), *Die Philosophischen Schriften*, vol. IV (Berlin, 1880), pp. 464-66, translated in Weiner, *op. cit.*, pp. 100-02.

[26] Descartes to More, August 1649, AT V 403-04 (K 257).

[27] P. H. J. Hoenen has suggested that the "other things" to which God gave the ability to cause motion in bodies are just other bodies. See the excerpt from his *Cosmologia*, translated as "Descartes's Mechanicism" in Willis Doney (ed.), *Descartes* (Garden City, 1967), pp. 353-68, esp. p. 359. But it is interesting that in the sections of *Principia* II that deal with the *causes* of motion, properly speaking, sections 36 and following, bodies are *never* mentioned as genuine causes. However, in Pr II 40 (AG 218) Descartes does mention, in addition to human minds, *angelic* minds as possible causes of motion. Angelic minds as causes of motion also come up in the letter Descartes wrote to More that immediately precedes the one from which I quoted. See Descartes to More, 15 April 1649, AT V 347 (K 252). This suggests that the "other things" in question in the August 1649 letter are not bodies, but angels.

[28] Pr II 36 (AG 215-16). See also Descartes to [the Marquis of Newcastle], October 1645, AT IV 328 (K 183).

[29] See *Meditation III*, AT VII 48-49 (HR I 168); *Second Replies*, AT VII 165 (HR II 56); Pr I 21 (HR I 227-28).

[30] The continual recreation account of God's activity creates a curious difficulty for the mental causation of events in the material world. When God is recreating the material world from moment to moment. He must put each material thing *somewhere* when He recreates it. But if it is God who determines the position of bodies from moment to moment, how is it possible for *minds* to affect the momentary position of a body? There seems to be no room for minds to act on Descartes' continual recreation picture. Nicholas Malebranche develops this difficulty into an argument for occasionalism in the seventh of his *Entretiens sur la métaphysique*.

[31] Pr II 36 (AG 215-16).

[32] Pr II 37 (AG 216).

[33] Pr II 39 (AG 217).

[34] Pr II 5-19 (AG 199-207).

[35] Pr II 36 (AG 215-16); Pr III 46-47 (AG 225-26).

[36] Pr II 42 (AG 219).

[37] Descartes to More, August 1649, AT V 403-04 (K 257).

[38] See, e.g., More to Descartes, 11 December 1648, AT V 238-40; More to Descartes, 5 March 1649, AT V 301; More to Descartes, 23 July 1649, AT V 379.

[39] More to Descartes, 11 December 1648, AT V 238-39. This seems similar to a point Spinoza makes in defense of his claim that God must have the attribute of extension. See *Ethics* I, prop. 15, scholium, in Spinoza (ed. Carl Gebhardt), *Opera* (Heidelberg, 1925), vol. II, p. 57.

[40] Compare, e.g., the discussion of the sense in which God is extended *in potentia* in the letters to More (Descartes to More, 15 April 1649, AT V 342 (K 249); Descartes to More, August 1649, AT V 403 (K 257)) with Descartes' remarks to Elisabeth about the sense in which it is proper to say that mind is extended (Descartes to Elisabeth, 28 June 1643, AT III 694 (K 143)).

[41] Descartes to More, 15 April 1649, AT V 347 (K 252).

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The Philosophical Review, Vol. 102, No. 2 (April 1993)

Descartes on Mind-Body Interaction and the Conservation of Motion

Peter McLaughlin

1. Introduction

One central element of the standard reading of Descartes on mind-body interaction (and one of the first things many of us ever learned about Descartes) is that the *quantity of motion* in the world is conserved, that the *mind* can neither create motion nor remove any of it from the world but can change the direction of the motion of the body. Bernard Williams tells us in the *Encyclopedia of Philosophy*, "consonant with [Descartes's] views on the conservation of motion, it is only the direction, and not the speed, of movement of these [animal] spirits that is affected by the soul."[1] The *locus classicus*, so to speak, for this reading is paradoxically not in a work of Descartes himself at all, but rather is found in §80 of the *Monadology* of Leibniz. There Leibniz reports,

> Descartes recognized that souls cannot give force to bodies because the same quantity of force is always conserved in matter. He believed, however, that the soul could change the direction of the body. But this was because the law of nature was still unknown in his day, according to which matter conserves also the same total direction. If he had noticed this, he would have fallen upon my system of pre-established harmony.[2]

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[1] Bernard Williams, "Descartes," in *Encyclopedia of Philosophy* (New York: Macmillan, 1967), 2:353.

[2] G. W. Leibniz, GP 6:620–621; PPL, 651. I shall use the following conventional abbreviations: AT = Descartes, *Oeuvres*, ed. C. Adam and P. Tannery (Paris: Vrin, 1964–74); K = Descartes, *Philosophical Letters*, ed. and trans. A. Kenny (Oxford: Blackwell, 1970); CSM = Descartes, *The Philosophical Writings of Descartes*, trans. J. Cottingham, R. Stoothoff, and D. Murdoch (Cambridge: Cambridge University Press, 1985), 2 vols.; GP = Leibniz, *Die Philosophischen Schriften*, ed. Gerhardt (Berlin, 1875–90); PPL = Leibniz, *Philosophical Papers and Letters*, ed. L. Loemker (Dordrecht: Reidel, 1969).

Leibniz expressed this view, which implies that the consistency of Descartes's metaphysics depends significantly on the failings of his physics, on dozens of occasions from around 1687 onwards;[3] and it is typical of the historical literature that an extensive discussion of Descartes's position on this issue is more likely to be found in a work on Leibniz than in one on Descartes himself. This state of affairs is perhaps best illustrated by Ernst Cassirer, who at the end of the chapter on Descartes in his *Erkenntnisproblem* offers us the offhand remark that "it is well known" that Descartes held this view and refers us in a footnote to his book on Leibniz for details.[4]

Much recent literature has, however, cast doubt on this reading of Descartes. For instance, Daniel Garber has asserted that "a close examination of Descartes' writings gives us good reason to believe that he never held the positions that Leibniz attributed to him, neither the change of direction account of mind body interaction nor the universality of the laws of motion." Garber appeals further to the purported "lack of any clear and positive statement of the change-of-direction account in any of the numerous writings that survive."[5] Peter Remnant, in a similar vein though somewhat more cautious, characterizes Leibniz's interpretation as "creative elucidation"[6] and believes that Leibniz is rather projecting his own principles onto Descartes. Like Garber, Remnant and others go on to question Descartes's commitment to the conservation of motion or at least to its applicability to those bodies that are joined to a soul. Two arguments are offered to persuade us to entertain a radically different interpretation of Descartes:

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[3] See, for example, GP 2:94, 3:122, 467–68, 568, 607; 4:497; 5:64, 208; 6:135–36, 540–47, 621.

[4] Ernst Cassirer, *Das Erkenntnisproblem*, vol. 1 (Darmstadt: Wissenschaftliche Buchgesellschaft, 1962), 504. In his *Leibniz' System in seinen wissenschaftlichen Grundlagen* (Darmstadt: Wissenschaftliche Buchgesellschaft, 1962), 58–67, to which he refers the reader, he presents the Leibnizian reading in some detail, but he nowhere indicates any text in which Descartes explicitly states the view attributed to him.

[5] Daniel Garber, "Mind, Body and the Laws of Nature in Descartes and Leibniz," *Midwest Studies in Philosophy* 8 (1983): 105–33 (see 111 and 115); "Understanding Interaction: What Descartes Should Have Told Elisabeth," *Southern Journal of Philosophy* 21 (suppl.) (1983): 15–32; "How God Causes Motion: Descartes, Divine Sustenance and Occasionalism," *Journal of Philosophy* 84 (1987): 567–80. See also Roger Ariew, "Mind-Body Interaction in Cartesian Philosophy: A Reply to Garber," *Southern Journal of Philosophy* 21 (suppl.) (1983): 33–37; Peter Machamer, "The Harmonies of Descartes and Leibniz," *Midwest Studies in Philosophy* 8 (1983):135–42; "Causality and Explanation in Descartes' Natural Philosophy," in *Motion and Time, Space and Matter*, ed. P. Machamer and R. Turnbull (Columbus: Ohio State University Press, 1976); Gary C. Hatfield, "Force (God) in Descartes' Physics," *Studies in History and Philosophy of Science* 10 (1979): 113–40; "Science, Certainty, and Descartes," *PSA 1988*, vol. 2, ed. A. Fine and J. Leplin (East Lansing: Philosophy of Science Association, 1989). Some of the arguments can be traced back to Norman Kemp Smith, *Studies in the Cartesian Philosophy* [1902] (New York: Russell & Russell, 1962).

(1) Descartes does not in fact state the change-of-direction position attributed to him by Leibniz (and most other philosophers), but he does on occasion conceive of the action of mind on bodies as *increasing* (or decreasing) the amount of motion in the body acted on—at the very least the motion of the pineal gland itself.

(2) The assertion of the conservation of the quantity of motion in the world is a statement about the constancy of God's action in the world and not about the causal interactions of bodies. Since conservation governs the motions of bodies only insofar as God moves them, there may be a loophole in the law for motions caused by human minds.

Both these arguments are mistaken. Leibniz, as we shall see, was basically right both on the historical question of what Descartes meant to say about conservation and change of direction and on the philosophical question of why he had to mean this. Furthermore, we shall see that the textual basis for his reading is somewhat better than contemporary critics make it out to be.

I shall deal with each of these arguments in a separate section of this paper. But before I turn to questions of textual interpretation and present the evidence for and against the correctness of the Leibnizian reading, I shall first present a somewhat updated and more explicit version of this interpretation and attempt to clarify what is philosophically at stake.

2. The Leibnizian Reading

In dealing with the question of mind-body interaction we should first distinguish two separate problems: (1) the question of the *intelligibility* of interaction between mind and body if they are conceived as radically distinct in the way Descartes conceived them, and (2) the subsequent question raised by the apparent *conflict* between mind-body interaction and conservation principles. The first question is symmetrical and must hold equally for the action of the body on the mind and for that of the mind on the body, that is, for both perception (or emotion) and volition. The second question is asymmetric insofar as it is sensibly raised only in connection with the action of the mind on the body; for Descartes introduced a conservation law only for the world of bodies, not for the mental world: no conservation of mental energy is asserted with which perception might interfere. However, the question of the compatibility of interaction and conservation can be sensibly discussed only if the connection between mind and body is assumed to be intelligible, or if compatibility is simply taken as an *additional* constraint on an intelligible relationship. In any case we should not confuse arguments for one thesis with those for the other. I shall be dealing here primarily with the second question, concerning the *compatibility* of the action of the mind on the body with conservation laws.[7]

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[6] Peter Remnant, "Descartes: Body and Soul," *Canadian Journal of Philosophy* 9 (1979): 377–86, at 386.

As far as compatibility is concerned, the modern mind-body problem generally taken to have been invented by Descartes may be characterized by the following set of propositions:[8]

(1) The material (corporeal) world is causally closed.
(2) The mind is nonmaterial.
(3) The mind acts upon the body (that is, makes a difference in the material world).

The mind-body problem arises inasmuch as these three propositions seem to be incompatible. Any philosopher who attempts to "solve" the problem must deny, relativize, or in some way get around one of these propositions. Leibniz denied (3); Hobbes denied (2); but hardly anyone who takes modern science seriously wants to deny (1). Descartes can be said to have *invented* the modern mind-body problem (as opposed to having simply offered a solution to it), insofar as he was not only the first to formulate (1) but also the first (and perhaps the only) philosopher ever to have subscribed to all three propositions.[9]

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[7] For a discussion of Descartes on the question of intelligibility itself, see Eileen O'Neill, "Mind-Body Interaction and Metaphysical Consistency: A Defense of Descartes," *Journal of the History of Philosophy* 25 (1987): 227–45; and Margaret D. Wilson, "Descartes on the Origin of Sensation," *Philosophical Topics* 19 (1991): 293–323.

[8] I take this presentation of the mind-body problem to be uncontroversial; this particular version is derived from Peter Bieri's introduction to *Analytische Philosophie des Geistes* (Meisenheim: Hain, 1981), 37.

How did Descartes manage this without obvious contradiction? Leibniz, in the passage from the *Monadology* (§80) quoted above and in many other places, maintains that Descartes was able to do this only because he had a mistaken notion of the "force" conserved in the world and of the constraints placed on causal closure by a *second* conservation law unknown to him. This prevented him from realizing that (3) cannot be reconciled with (1), given (2). Had Descartes realized this, he would, says Leibniz, have denied (3). Leibniz is right. Whether Descartes would have gone on to propose preestablished harmony is of course another question, especially since Descartes, as opposed to Leibniz, did not consider mind-body interaction to be *prima facie* unintelligible. But let us note that Leibniz was quite able to distinguish and employ two different arguments: (1) mind-body interaction is unintelligible and thus cannot be asserted, and (2) mind-body interaction is incompatible with the conservation laws on which physics is based and thus cannot be asserted. When arguing against Cartesians, he understandably often preferred the second argument.

According to Leibniz, Descartes was able to consider the above three propositions to be consistent because he defined the causal closure of the material world by only a single conservation law, namely, the conservation of the total amount of causal power and causal action, a scalar quantity that he called "force" or "motion" and measured (wrongly) by $|mv|$.[10] This allowed him to countenance purely directional changes in the vector of motion, which were of course causally relevant, but to conceive them to be *dynamically neutral* in the sense of neither adding to nor subtracting from the aggregate force (motion) in the world. The concept Descartes introduced for the vector of motion was *determination*—in substantival, verbal, and adjectival form this is a technical term central to Cartesian physics that can (loosely) be represented by mv considered as a directed magnitude. Determination is not merely direction since it has a *quantity* and can be divided into parts, but it is also not an *independent* magnitude since its value is always fixed by the body's quantity of motion, of which it is only a mode.[11] To clarify this concept, I shall briefly sketch its place in Descartes's physics and its connection to the conservation of motion.[12]

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[9] Garber, Remnant, etc. in principle deny that Descartes asserts (1), and thus imply that he neither invented nor offered a solution to the modern mind-body problem. On Descartes's role in the history of the mind-body problem, see Martin Carrier and Jürgen Mittelstrass, *Mind, Brain, Behavior* (Berlin: De Gruyter, 1991), 16–27.

[10] The fact that Descartes's measure of scalar "force" was $|mv|$ (or more precisely, the product of *size* and *speed*) instead of mv^2 (as Leibniz corrected it) is important for the construction of his physics but is not relevant to the question at hand here.

In book 2 of the *Principles of Philosophy*, which contains the deductive core of his physics, Descartes first introduces the concept of matter (and its contrary, nothingness or the void) (§§1–22) and then one *mode* of matter, motion and its contrary, rest (§§23–35). He then turns to the causal aspects of matter in motion (§§36–64). In this last part of book 2 he begins by defining the (minimal) *identity conditions* for the system of the world as a whole in terms of the two basic concepts just introduced: $\Sigma\ m$ = constant and $\Sigma\ |mv|$ = constant (where m is the quantity of matter and v the speed). The material universe is considered to be the same over time as long as neither its size nor the amount of action or motion going on within it undergoes change.[13]

In §36 Descartes tells us that God is the primary cause of the world and of the motion in it and that by his "ordinary concourse" he preserves it in existence and motion. There are of course countless changes in the *distribution* of the motion throughout matter—some parts become swifter while others become slower; but these particular internal changes, so long as there is no change in the sum total, are compatible with the constancy of God's action, which preserves the *whole* as it is. Reason tells us that since God created the world with certain defining properties, it will continue to retain precisely those properties that justify us in calling it the same world, namely, the quantities of matter and motion.

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[11] Thus, in spite of what one often reads, it is not the case that "a change can occur in one without any change in the other" (Hatfield, "Force," 118); on the contrary, any change in the quantity of motion entails a change in the (quantity) of determination, though the directional aspect of determination can change without any change in the quantity of motion.

[12] See Peter Damerow, Gideon Freudenthal, Peter McLaughlin, and Jürgen Renn, *Exploring the Limits of Preclassical Mechanics* (New York: Springer, 1992), chap. 2, for an extensive analysis of the role of this concept in Cartesian physics; see also 293–332 for an English translation of most of the relevant material.

[13] AT 8:61–62; CSM 1:240.

Although Descartes anchors this conservation law in the reasonableness of God's constancy and immutability, the actual argument as to what it means for the material world to be the same world at two different times has to do with the nature of matter and motion, not with that of God. A formal, second-order property of God such as the constancy of his modes of action cannot specify the content of the concept of force, for instance, whether its measure is $|mv|$ or mv^2. Leibniz reads Descartes as rightly demanding a fundamental conservation law to which all laws of nature must themselves conform, but he disagrees with Descartes on the content of this law and denies that this content can really be deduced from the predicates ascribed to God. Thus, the standard view of the role of the conservation of motion in Descartes's system is that it is a metamethodological principle: that "God's nature sets constraints on what the laws of nature should be, requiring in particular that there should be a conservation law."[14]

After introducing conservation, Descartes then in the First Law of Nature (§37) defines what staying the same (remaining in the same state) means for a *single body*: it changes neither of its two fundamental modes, shape or state of motion, of its own accord. According to the Second Law of Nature (§39), a single body considered separately also retains the (second-order) mode or *determination* of its motion.[15] Finally, in the Third Law of Nature (§§40ff.), *change* in the modes of bodies through interaction with other bodies is defined and quantified: the change in motion and/or determination of a body through interaction with another body occurs according to certain (impact) rules within the constraints set by the conservation of motion.[16] Thus, since the conservation of determination is stipulated only for single bodies and not for the system as a whole, there is no algorithm directly governing what actually happens to a body's determination in impact, nor is there any necessity that change in the determination of one body be correlated to an equal and opposite change in some other body.

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[14] Bernard Williams, *Descartes: The Project of Pure Inquiry* (Harmondsworth: Penguin, 1978), 269. See Leibniz, *Animadversiones in partem generalem principiorum cartesianorum,* GP 4:370–72; PPL, 393–95. See also Damerow et al., *Exploring the Limits*, 68–78.

[15] Most translations—by ellipsis or lack of precision—leave the content of this law completely unclear. See AT 8:62–65.

In the *Dioptrics*, "determination" is used to analyze the trajectory of a tennis ball colliding with the court surface. The determination of the ball's motion is resolved into component determinations (vertical and horizontal) according to the parallelogram rule (vector addition). In deriving the inverse sign law of refraction, determinations are added vectorially and motions arithmetically. The resulting problems constitute the main subject matter of much of Descartes's correspondence with Fermat, Hobbes, and Bourdin. *Determination is also the concept used to analyze the action of the mind on the body.* The salient aspect of the concept of determination in this context is that the determination of a motion or a change in its determination (so long as no change in scalar speed is involved) *requires no force.* As Descartes wrote to Mersenne,

> It should be noted that motion is different from the determination that bodies have to move in one direction rather than another, as I wrote in my *Dioptrics*; and that, properly, force is only needed to move bodies and not to determine the direction in which they are to move.[17]

In the example discussed in the *Dioptrics*, it is the *power* of the muscles in the arm that produces the *motion* of a tennis ball hit by a racket; it is the *position* of the racket and then of the court surface that *determines* this motion in one direction or another. Or as Descartes once answered Hobbes,

> For example, I throw a ball against a wall; the wall determines the ball to return towards me, but it is not the cause of its motion.[18]

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[16] There are also implicit symmetry assumptions and an extremal principle elaborated only in a later letter to Clerselier (Feb. 17, 1645; AT 4:183–88).

[17] June 11, 1640; AT 3:75.

[18] Descartes to Mersenne, April 21, 1641; AT 3:355.

DESCARTES ON MIND-BODY INTERACTION

The Cartesian mind acts on the body in a forceless manner analogous to that of a surface on a colliding body. It neither adds nor subtracts motion; it merely determines it in another direction. This analogy between mind and surface may in fact have led to the transfer of the concept of determination from the discussion of free will to physics.[19] As early as *Le Monde* (1632), before he had introduced the concept of determination into his physics, Descartes was explicitly looking for an analogy between the ability of the disposition of bodies in space to cause the *motions* of other bodies to deviate from the rectilinear and the ability of the disposition of our will to cause our *actions* to deviate from the good.[20] And even in his mature physics Descartes leaves open the possibility of directional changes by dispositions of the mind.[21] In physiological contexts Descartes speaks of the animal spirits as "determining" the muscles to this or that motion, that is, infinitesimally triggering the force stored in them: just as the "least conceivable force" can "determine" a weight balanced on a curved surface to fall along various paths, so too can a muscle be determined to contract or expand.[22] While it may indeed be unclear *how* the nonextended soul is supposed to act in a manner analogous to a brick wall or an infinitesimal nudge by the animal spirits, it is certainly no less intelligible to assert that the mind *determines* motion than that it *causes* motion. Furthermore, once one has embarked on this route, there is no reason for stopping or turning back: the motion of the body is determined, not caused, by that of the animal spirits; the motion of the animal spirits is determined, not caused, by that of the pineal gland; and the motion of the pineal gland is determined, not caused, by the actions of the soul. Nothing would be gained in terms of intelligibility by assuming that the mind actually moves the pineal gland, and everything would be lost in terms of consistency.

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[19] The concept of determination was used in discussions of free will in the sense that the will determines *itself* to action. See Francisco Suarez, *Opera omnia* (Paris, 1856), vol. 10, 459ff.; and Descartes, letter to [?], March 1638; AT 2:36; and *Passions* §170; AT 11:459.

[20] AT 11:46–47. In this comment on the original third law, which was to become the Second Law of Nature in the *Principles* (conservation of determination), God is taken to be the *ultimate* author both of the *motions* of bodies (insofar as they are rectilinear) and of the *actions* of humans (insofar as they are good).

[21] *Principles* 2, §40; AT 8:65.

[22] AT 11:518–19; also 131–32, 176–77, 179, 194.

In the *Principles* Descartes does not assert the conservation of determination for the system as a whole; only scalar motion is conserved throughout all interactions. Leibniz—and classical mechanics—added a second system conservation law for the vector quantity now called *momentum*, so that the causal closure of the world came to be determined by two laws: the first asserted the conservation in the system of matter of the scalar quantity, *vis viva* (energy), the second demanded the conservation in the system of matter of the vector of motion.[23] This puts additional constraints on causal closure and prohibits Descartes's solution: there could no longer be a causally relevant but dynamically neutral change in the direction of motion. If the (nonmaterial) soul is to change the direction of motion, the material world is not causally closed.

This is all well and good and may certainly reflect the opinion of Leibniz or Cassirer; but where does Descartes actually say anything of the sort? And where does he replace the wall and the tennis ball with the soul and bodily movements? Where is the concept of *determination*, which is used to describe the forceless action of the wall on the ball, also used in a technical sense to describe the action of the soul on the body?

3. Does the Mind Cause or Merely Determine Motions?

For those unfamiliar with the debates on this subject in the literature or with the widely scattered passages cited from Descartes's works, it may be helpful to review them briefly. And it may help to bring things down to earth if I point out that we are in principle dealing with about *fifteen* pages of Cartesian text,[24] each of which contains only a few sentences that may plausibly be asserted to be both unambiguous and relevant to the question at hand. Thus, not only can anyone who wants to do it check all the material, but I can (and will) quote most of it in the course of the next few pages. I shall deal first with the purported lack of evidence for the Leibnizian reading, and then turn to the textual evidence for the mind's originating motion.

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[23] See, for example, GP 2:94 and 3:568.

[24] To be precise AT 3:665; AT 5:222–23, 276, 347, 403–4; AT 7:229; and AT 11:180 and 185, 225–26, 355, 360, 361, 365, 518–19, and 631. Some other passages (AT 11:131–32, 176–77, 179, 194) are important for the physiological mechanisms of emotion and perception.

We shall see that two or three passages state more or less exactly what Leibniz attributed to Descartes. In four others Descartes speaks of the mind's moving the body in terms that cause genuine (though not insurmountable) difficulties for the Leibnizian reading. In the rest he says nothing that on closer examination commits him either way. None of the apparent mind-moves-body passages are so central, unambiguous, and compelling that they could offer serious resistance to a hermeneutic regulative principle such as "Don't interpret Descartes as saying anything inconsistent with the conservation of motion in the world!" For Leibniz the formulation of the conservation of force was the great achievement of Cartesian natural philosophy, and this hermeneutic rule was thus more or less self-evident. Those interpreting Descartes differently are apparently guided by a different hermeneutic prescription, and it would be interesting to know what it is and why they subscribe to it.[25]

3.1 Evidence for the Leibnizian Reading

Let us begin with the evidence for the Leibnizian reading of Descartes, both textual and contextual. This reading isn't original with Leibniz. It seems to have been quite common in Parisian Cartesian circles and had every claim to orthodoxy. Clerselier and other insiders[26] had stated it explicitly in print before Leibniz formulated his position. And Princess Elisabeth had originally opened her correspondence with Descartes in 1643 by stating precisely the view in question; in fact, the question she asked in her first letter was how she was supposed to conceive of the ability of the nonextended and thus shapeless soul to *determine* the motion of the animal spirits.[27] In Paris Leibniz moved in circles of people who had known Descartes personally. He also had access to manuscripts no longer available to us; in fact one of the passages to be discussed below is known to us only because Leibniz copied and kept it.[28] There is, however, no need to appeal to documents no longer available to us that Leibniz might have read in Paris. Elisabeth needed only a careful reading of the *Meditations* (and presumably of the *Diotropics*). There are clear passages in central writings and in the appropriate sections of the *Traité de l'homme* and the *Description du corps humain* at the places where he deals with the technical details of just exactly how the mind prevails upon the pineal gland to change the course of the animal spirits so as to bring about bodily movements.

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[25] I know of no clear statement of the hermeneutic prescription guiding anti-Leibnizian readings; a suitable candidate might be "Interpret Descartes as a representative of pre-Hobbesian moral psychology, who has the soul subdue the passions not by means of other passions but by means of its own force."

[26] Clerselier in a letter to La Forge, Dec. 4, 1660 (in *Lettres de M. Descartes*, vol. 3 (Paris, 1667), 642) wrote, "mais que la finie [substance spirituelle], comme l'Ame de l'homme, peut seulement estre capable de determiner le movement qui est desia." Johann Clauberg in *Corporis et animae in homine conjunctio plenius descripta*, chap. 26, §4 (originally part of his *Physica*, Amsterdam, 1650) wrote, "Non utique motus in majore aut minore mundo quantitatem augendo vel mineundo, . . . sed in alias tantum partes eum convertendo" (*Opera omnia philosophica* (Amsterdam, 1691), vol. 1, 230; Olms, 1968).

Given the structure of Descartes's scientific system, a technically precise explanation of how the mind changes the direction of motion must be couched in terms of *determination*. We need a statement by Descartes to the effect that the mind does not *move* the body but only *determines* its motion.

In the *Meditations* (4th reply) we read,

> Thus, even in ourselves, the mind does not immediately move the external limbs but only directs the [animal] spirits flowing from the heart through the brain into the muscles and *determines* them to certain motions, for of their own accord these spirits could be applied just as easily to many different actions.[29]

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[27] Elisabeth wrote to Descartes, "en vous priant de me dire comment l'ame de l'homme peut determiner les esprits du corps, pour fair les actions volontaires" (AT 3:661).

[28] AT 11:631; this particular passage will, however, turn out not to be relevant to the question of mind-body interaction.

[29] AT 7:229; my translation and emphasis. Most translations I have seen manage to garble this sentence. The original reads, "adeo ut nequidem in nobis ipsis mens immediate moveat membra externa, sed dirigat tantum spiritus a corde per cerebrum in musculos fluentes, eosque ad certos motus determinet, cum ex se isti spiritus ad multas actiones diversas aeque facile applicentur."

That is, the mind can change the course or direction of the animal spirits as they flow through the brain directing them to particular muscles, and thus by this means it determines these muscles to certain motions. That the mind does this by means of one particular gland had already been stated in the Sixth Meditation.[30]

In the preface to the *Description du corps humain* Descartes says,

> And even the movements we call "voluntary" proceed principally from this disposition of the organs, since they cannot be excited without it, whatever will towards them we may have, though it is the soul that *determines* the movements.[31]

In each of these passages the soul is said to *determine* motions of the body, and in the first it is clear that this is done by redirecting the animal spirits. And in many passages in the *Traité de l'homme*[32] "determination" is the technical term used to describe the action of perceptions on the animal spirits and of the animal spirits on the brain.

But we still have no passage where Descartes explicitly says that the mind does not move the *pineal gland itself* but only determines its motion. Peter Remnant, in a rhetorical flourish, asks, "Are we to suppose that it [the mind] only changes its [the pineal gland's] direction, and not speed, of motion—something like a punching bag in perpetual use?"[33] The only consistent answer is, Yes!—with the reservation that the punching bag simile is somewhat off the mark, since it is clear from the Third Law of Nature that however the mind acts, it does not act by *impact.* There seems, however, to be no passage where Descartes actually *explicitly* says what is in fact a trivial consequence of his position. The closest he comes to this is when he writes the following:

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[30] AT 7:86, CSM 2:59–60.

[31] AT 11:225; my translation and emphasis.

[32] AT 11:131–32, 176–77, 179, 183, 194; see also 518–19.

[33] "Body and Soul," 380. Kemp Smith (*Studies*, 83n) writes, "But though Descartes frequently speaks of the motion of the 'animal spirits' as being merely directed (not originated) by the movements of the pineal gland, he never, so far as we are aware, suggests that those movements of the pineal gland, which are involved in voluntary action, can be explained in a similar manner as previously existing and merely guided by the mind." Jean Laporte, in *Le Rationalisme de Descartes* (Paris: Presses Universitaires, 1950), asks, "Is the soul limited to 'determining' an already existing motion [of the gland]? Descartes says nothing of the kind" (247).

> There are *two principal causes,* not counting the force of the mind which I shall treat later, which can make it [the gland H] move in this way and which I must explain here.
>
> The *first* [*cause*] is the difference occurring among the small particles of the spirits that proceed from [the gland]. For if all these spirits were of exactly the same force and if there were no other cause at all that *determined* them to tend one way or the other, they would flow equally through all the pores and keep [the gland] straight and immobile in the center of the head as represented in Fig. 40. . . . The *second cause* that can *determine* the motions of the gland H is the action of objects affecting the senses. . . .[34]

The manuscript ends some twenty pages later, before Descartes has gotten around to explaining the *third* cause that can make the gland move this way or that—the mind. But each of the two physical causes is said to *determine* the gland to tend or move this way or that. That is, the emotions (first cause), by way of differences in the flow of the animal spirits, determine the motion of the pineal gland, and external objects (second cause) by way of perceptions can also determine the motion of the gland. Even though the manuscript ends before the third (and nonphysical) cause is dealt with, the structure of explanation is clear: the two causes treated are causes not of motions but of the determination of motions; at least the expectation must be that the third cause (the mind) is also a cause of *determining* the motion of the gland. That is, passions, perceptions, and (presumably) volitions all exercise their causal influence only by determining the motion of the pineal gland.[35]

This interpretation of the *Traité de l'homme* may receive some additional historical support from the fact that Descartes's immediate disciples had no difficulty in filling in the missing pieces. In his textbook version of this argument Jacques Rohault includes the missing third cause in strict parallel to the other two:

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[34] AT 11:180–85; emphasis added. It should be noted that the first ellipsis represents *eight* pages of text in the original edition.

[35] Descartes writes in the *Passions,* "And the activity of the soul consists *entirely* in the fact that simply by willing something it *brings it about* that the little gland to which it is closely joined moves in the manner required to produce the effect corresponding to this volition" (AT 11:360, CSM 1:343; emphasis added).

> For it is easy to conceive, that, the figure and particular *agitation of the particles* which compose these spirits, or the *action of external objects* upon the sense organs, or, in us, the *inclination* to such or such a motion *determining* [*determinant*] those spirits to enter one nerve rather than another, they will then arrive at one particular muscle rather than another; which, due to the common structure of all muscles, swelling and growing shorter, makes the tendon pull that part of the body to which it is affixed and thus causes the motion of our limbs.[36]

The passages quoted above seem to be all there is, but they do give serious support to the traditional interpretation. None of the recent literature questioning the Leibnizian reading deals with any of the three passages from Descartes adduced above,[37] and none of it has been sensitive enough to the form in which a change-of-direction statement would have to be formulated to notice that Elisabeth's original question to Descartes deals not with the *cause* of motion but with its *determination*, that is, that it *presupposes* the "Leibnizian" interpretation. Thus, I think we can justly consider the argument that the Leibnizian interpretation lacks a textual basis to be untenable. Although Descartes only very rarely makes an unequivocal statement about the technicalities of the action of the mind on the body, whenever he does, he invariably chooses "determination" to characterize this action. Not only does coherence demand that we interpret Descartes as holding a position consistent with the conservation of motion in the world, Descartes himself says enough that we don't have to invent the position ourselves.

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[36] Jacques Rohault, *Traité de Physique* (Amsterdam, 1672), 451–52 (pt. 4, chap. 17, §4), emphasis added. Rohault here is simply following the lead of the editors of Descartes's *De l'homme*, La Forge and Schuyl, both of whom emphasize the parallels between the three causes. See Schuyl's "Ad lectorum" (unpaginated, ninth page) in *De Homine* (1662) and La Forge's note to the passage about the "second cause" in *Traité de l'homme* (1664), 364.

[37] To my knowledge, in the recent literature only Alan Gabbey, "The Mechanical Philosophy and its Problems: Mechanical Explanations, Impenetrability, and Perpetual Motion," in *Change and Progress in Modern Science*, ed. J. Pitt (Dordrecht: Reidel, 1985), (*University of Western Ontario Series in Philosophy of Science*, 27), 20 and 70–71, cites part of these passages.

3.2 Evidence for the Anti-Leibnizian Reading

A number of passages have been cited in favor of the anti-Leibnizian view in which Descartes seems to assert that the mind is the cause of *motion.* These passages can for the purposes of discussion be divided into three groups: (1) a number of letters to Elisabeth, Arnauld, and More, (2) statements in the *Passions of the Soul,* and (3) a manuscript on motion from about 1635.

The first group is of particular importance—in spite of the fact that the passages cited do not really prove anything—because they, nonetheless, give rise to misgivings that remain even when we set the objections aside. These passages have often been cited both by proponents and by critics of the Leibnizian view; neither side has considered them decisive.[38] Recent critics, while citing these passages as auxiliary support, rest their cases on the second and third groups. Remnant bases his argument primarily on the *Passions,* and Garber puts his bets on the 1635 manuscript.

The often cited mind-moves-body passages from Descartes letters are the following:[39]

> I shall endeavor to explain the way I conceive the union of the mind with the body and how it has the force to move it. . . . As regards mind and body together, we have only the notion of their union, on which depends our notion of the force the mind has to move the body, and the body to act on the mind causing sensations and passions. (Letter to Elisabeth, May 21, 1643; AT 3:665; K, 138)

> Moreover, that a mind, which is incorporeal, can impel a body is shown to us every day by the most certain and most evident experience, without the need of any reasoning or comparison with anything else. . . . Many philosophers who think that the heaviness of a stone is a real quality distinct from the stone think that they understand well enough how such a quality can move the stone toward the center of the earth, since they think that they have a manifest experience of it. I, who have persuaded myself that there is no such quality in nature, nor thus any true idea of it in the human intellect, believe that they use the idea which they have of incorporeal substance to represent that

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[38] Garber characterizes the remarks in the letters to Elisabeth, Arnauld, and More as "casual and . . . given in the context of nontechnical and almost off-the-cuff explanations" ("Mind, Body and the Laws of Nature," 112).

[39] The translations for the most part follow Garber (and Kenny).

> heaviness to themselves. Thus, it is no more difficult for us to understand how mind moves body than it is for them [to understand] how this heaviness bears a stone downwards. (Letter to Arnauld, July 29, 1648; AT 5:222–23; K, 235–36)
>
> Of course I do not think that any mode of action belongs univocally to both God and creatures, but I must confess that the only idea I can find in my mind to represent the way [*modus*] in which God or an angel can move matter is the one which shows me the way in which I am conscious I can move my own body by my own thought. (Letter to Henry More, April 15, 1649; AT 5:347; K, 252)
>
> The force moving [a body] can be that of God himself conserving as much translation in matter as he placed in it in the first moment of creation; or also that of a created substance, like our mind or that of some other thing to which he gave the force of moving a body. (Letter to Henry More, August 1649; AT 5:403–4; K, 257)

Had not Descartes in his published writings explictly maintained that the quantity of motion in matter is conserved, it is unlikely that these particular correspondents would have attributed such an opinion to him. Considered in isolation or in an appropriately constructed context, they do seem to attribute to the soul the power to *move* the body. But note that in none of these passages is the alternative between the production of motion and determination of motion even mentioned. In fact the question of the *compatibility* of mind-body interaction and conservation is not being discussed at all. All passages deal with the *intelligibility* of interaction as such, which Descartes is attempting to justify.[40] The introduction of the distinction between the mind's changing a body's motion and changing the directional mode of its motion would not serve to make more plausible the substantial union of body and soul. While we might well wish that Descartes had not ignored his own technical distinctions, it is nonetheless clear that his intent here is to affirm generically the *action* of the mind on the body, rather than to single out a specific *kind* of action that is incompatible with his conservation law. There is no indication whatever that he is using "move" (or "force") in the strict technical sense of "impart $|mv|$," that is, "move as opposed to merely determine." Any interpretation must choose to attribute to Descartes either minor infelicities of expression or major inconsistencies of content. And, as we have already seen, in those contexts where Descartes does in fact take the distinction between motion and determination into account he attributes only determination to the soul. Genuine misgivings may and perhaps should remain, but they are only misgivings.

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[40] Garber quite rightly sees that in his first reply to Elisabeth "Descartes is attempting to establish that mind body interaction is *per se* intelligible" ("Understanding Interaction," 27–28). Had he noticed that this is *not* the question Elisabeth actually posed, he could have adduced a much stronger argument by pointing to the *difference* between Elisabeth's first letter and her second letter, in which she restates the question in terms of motion—how "nous devons juger comment l'ame . . . peut mouvoir le corps" (June 10/20, 1643; AT 3:684). The decisive event occurring between the apparently "Leibnizian" formulation of the first letter and the "anti-Leibnizian" formulation of the second is the receipt of a letter from Descartes himself. If we assume that Elisabeth was not just parroting Descartes's words when she originally spoke of determination, this singular fact must give rise to more misgivings than any of the anti-Leibnizian arguments put forward in the literature. Descartes seems to have missed a golden opportunity to give a concise explanation to someone who would have understood it.

The second group of quotations often cited are found in the *Passions of the Soul*, where Descartes speaks in a somewhat more technical context about the interrelations of body and soul, although the primary context is not the actions of the soul but its passions. From §§34–47 in the first book we can glean the following representative remarks about the action of the soul on the body:

> (§34) . . . [the gland] can be *moved* in various ways by the soul. . . .
> (§41) . . . [by willing] the soul *brings it about* that the little gland to which it is closely joined moves in the manner required. . . .
> (§42) . . . this volition *makes* the gland lean first to one side and then to another. . . .
> (§43) . . . this volition *makes* the gland drive the spirits to the muscles. . . .
> (§47) . . . the little gland in the middle of the brain can be *pushed* to one side by the soul and to the other side by the animal spirits . . . and these two *impulses* [*impulsions*] often happen to be opposed, the stronger cancelling the effect of the weaker; . . . the force with which the soul by its volition *pushes* the gland in a contrary direction. . . .[41]

Although some expressions (such as the first above) vaguely state that the mind moves the body in the same sense as in the letters cited above, almost all the assertions about mind-body interaction from the *Passions* are expressed in the language of indirect causality: the soul does not *do* anything, it *has* things done.[42] The expression used is normally *faire que* (to *bring it about* that something happens, to *make* something happen) and occasionally *laisser* (to *let* something be done, or *have* it done). This is precisely the terminology that Descartes uses in the *Dioptrics* when he introduces the distinction between motion and its determination. The determination is said to make the tennis ball descend (*la fait descendre*) or advance horizontally (*la fait avancer*) according to the parallelogram rule; but Descartes is explicit that he does not mean by this that the determining cause affects the quantity of motion.[43] Thus, most of Descartes's descriptions of the action of the soul on the pineal gland in the *Passions* are completely compatible with the conservation of motion since they are formulated in the vocabulary introduced to guarantee compatibility.

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[41] Descartes, *Passions of the Soul*, AT 11:355–66, CSM 1:341–47; emphasis added.

Let us also take up the most vivid example, the last quotation (§47), which does *not* use the language of indirect causality: we are to picture the soul pushing the pineal gland one way while the animal spirits push it in the opposite direction.[44] This seems obviously to be a case of *forces* in equilibrium; and if the soul is to overcome the force of the animal spirits then it must also be able to apply more force than they do. But what about the action of the animal spirits on the gland? Do they really *push*? As we saw above, when Descartes gets down to the hard physiological details of *body-body interactions*, he says not that the animal spirits *move* the gland, but that they *determine* its motion. But the vividness of Descartes's example of the soul counteracting the animal spirits is based on the implicit assumption that the soul "pushes" *in the same way* as the animal spirits. If the actions of the animal spirits are seen as *deter-*

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[42] For an analysis of the terminology of indirect causality in Descartes and late scholastic philosophy see Rainer Specht, *Commercium mentis et corporis: Über Kausalvorstellungen im Cartesianismus* (Stuttgart: Frommann, 1966), chap. 2.

[43] See, for example, AT 6:95 (CSM 1:157–58) and Damerow et al., *Exploring the Limits*, 103–25.

[44] Remnant "Body and Soul," (381) takes this passage to be decisive. And in Kemp Smith's (mis)translation, which he cites, it indeed contains the much stronger statement, that the soul acts on the pineal gland by *impact*; but it is obviously wrong to translate "impulsion" as *impact* here.

mining the motion of the gland, as Descartes repeatedly asserts,[45] how are we to conceive the "impulsions" of the mind? If we want to keep the vivid symmetry we must say that the action of the mind, too, consists in determining a motion. In fact, any attempt to take the *Passions* passages in a more technical sense than the letters discussed above forces us to interpret them as consistent with the well-entrenched doctrines of the *Dioptrics, Principles,* and *Meditations.* Impulsions of the mind neither harmonize nor clash with the conservation of scalar motion. If we take them to cause changes in speed, they clash; if we take them to cause changes in direction, they harmonize. Which choice comes closest to Descartes's intentions depends on what those intentions were. I take it he intended the *Passions* to be compatible with the *Dioptrics, Principles,* and *Meditations.*

The third group of passages deals with an example where Descartes, although he speaks only of motion (and doesn't mention determination), deals with a case of *acceleration.* If a soul is said to *increase* the motion of a body, Descartes cannot be interpreted as merely saying in lax terminology that the soul determines the direction of motion. The letter to Arnauld quoted above, which compares the mind to gravity, is taken by Garber[46] to imply that the mind can cause motion to increase just as heaviness is thought to do; but this is certainly untenable. First of all, it is clear from the context that the problem being discussed is the *intelligibility* of mind-body interaction, not the question of the compatibility of such interaction with conservation principles. Secondly, the comparison Garber makes doesn't work: heaviness as a "real quality" is *not* a cause of motion for Descartes; gravitational acceleration is caused by the impact of particles or by hydrodynamic processes in a medium. If we say that the mind causes the motion of the body just like heaviness causes gravitational acceleration, we are in effect *denying* that the mind causes motion. Thus this passage would suggest just the opposite of what Garber intends, if it were in fact relevant.

However, Garber himself puts much more stock in a second passage, in which he believes the implication that the mind increases the quantity of motion is "clearest of all." This is a manuscript dating from around 1635.

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[45] AT 11:131–32, 176–77, 179, 194.

[46] AT 5:222–23; Garber, "Mind, Body and the Laws of Nature," 113–14.

> If a body is pushed or impelled to motion by means of a uniform force of course imparted to it by mind [*mens*] (for there can be no other such force otherwise), and if it is moved in a vacuum, then it would always take three times longer to travel from the beginning of the motion to the midpoint than from the mid point to the end. However, there can be no such vacuum. . . . But suppose that the body were impelled by heaviness. Since that heaviness never acts uniformly like mind [*anima*], but [acts by] some other body which already is in motion, it can never happen that a heavy body is impelled more quickly than that which moves it. . . .[47]

Garber interprets this passage as contrasting the uniform acceleration caused by the mind with the nonuniform acceleration caused by gravity (interpreted as a particle stream) and thus concludes that "Descartes thought that the action of mind on bodies does *not* result in a mere change of direction. Rather, Descartes quite clearly thought, mind can produce a real change of *speed* of a body. . . ."[48] However, this manuscript tells us nothing about mind-body interaction; it describes an entirely counterfactual situation—uniform acceleration. The logic behind the example is the following: We want an example of continuous uniform acceleration. But (1) in a *medium*, acceleration by a given accelerating force is not uniform since it is increasingly retarded by the medium, and there is an upper limit to velocity. (2) In a *vacuum*, on the other hand, there can be no acceleration at all by material causes, because there is no matter to cause it. (3) Even assuming a vacuum only *on one side* of the body, with a real accelerating force on the other, acceleration would still not be uniform because the particle stream has a given velocity, so that there is again a maximum speed reached asymptotically. The free fall of a real body due to gravity is, according to Descartes, not uniformly accelerated at all. In his view, the only way to conceive of acceleration at all *inside* a vacuum is to consider its cause to be noncorporeal, and the only way to conceive of acceleration as uniform and open-ended is also to conceive its cause to be noncorporeal, such as a mind. In this manner Descartes entertains the notion of a body accelerated uniformly within a vacuum by a mind and considers the relations of times, spaces, and velocities under these assumptions. In such a situation the mathematical relations familiar from his earlier work on falling bodies would hold exactly.[49] But, as Descartes states in the passage quoted, there is no such thing as a vacuum, and—as he indicates in the part represented by the first ellipsis—there is no such thing as uniform acceleration. Thus, there is no more reason to take Descartes to be affirming the acceleration of a body by a soul in a vacuum than there is to take him to be affirming the existence of a vacuum itself. 'If *p* then *q*' does not imply '*p*'. Thus, this passage provides no evidence at all that Descartes abrogates the conservation of motion with the actions of the soul. It provides evidence only of Descartes's reasons for considering certain abstractions made in deriving the law of falling bodies to be a waste of time.[50]

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[47] Ibid., 114; AT 11:629–30; the translation (including ellipsis) is Garber's. See Damerow et al., *Exploring the Limits*, 35ff., for an analysis of the entire manuscript section et al.

[48] Garber, "Mind, Body and the Laws of Nature," 114–15.

To sum up the results so far: (1) Descartes possesses a technical scientific vocabulary capable of expressing the action of the mind on the body without contradicting the conservation of motion. (2) He sometimes uses this vocabulary to state explicitly that the mind merely determines the motion of the body as opposed to moving it. (3) He never uses this vocabulary to say explicitly that the mind moves the body as opposed to merely determining its motion. (4) In his physiology he generally expresses the analogous action of the animal spirits on the limbs or on the pineal gland in terms of determination. (5) He sometimes speaks of the mind's moving the body or having the "force" to move it. In this last case we must ask whether Descartes intends the term in the generic everyday sense of "act upon" or in the specific scientific sense of "act upon so as to increase scalar momentum." Only if we take him here to be using

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[49] The question and the answer are essentially the same as those discussed with Beeckman seventeen years earlier—although the formulation has become more strongly counterfactual. On the development of Descartes's derivations of the law of falling bodies, see Damerow et al., *Exploring the Limits*, chap. 1.

[50] Descartes says as much in letters to Mersenne from the same period. See, for example, October 1631[?], AT 1:221–22; March 11, 1640, AT 3:36–38; June 11, 1640, AT 3:79.

"move" in a strict technical sense is he necessarily being inconsistent. "Determination," which specifies the directional mode of |*mv*|, is a precise technical term, whose use more or less automatically defines a context as technical; however "force" and "motion" have a broad range of everyday-language meanings in addition to their (various) physical meanings,[51] so that we have to rely on context and consistency to decide how strictly we are to take them. The decisive question is, thus, How important and deeply entrenched is the conservation of motion in Descartes's system? Must he always have taken it into account? The interpretation of most mind-moves-body passages is itself largely dependent on an evaluation of the importance for Descartes's system of the conservation of motion in the world. Let us see what arguments speak against conservation.

4. Conservation of Motion

The second anti-Liebnizian argument is based not so much on the collection of apparently conflicting statements by Descartes,[52] but on an analysis of the reasoning by which Descartes grounds the conservation of motion in the *Principles* (2, §36). The general validity of the conservation law is said to be ultimately inconsistent with Cartesian Metaphysics.

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[51] See R. W. Westfall, *Force in Newton's Physics: The Science of Dynamics in the Seventeenth Century* (New York: Elsevier, 1971), appendix B, "Descartes' Usage of *Force*," 529–34, for an analysis of the range of technical and nontechnical meanings of the term 'force' in Descartes's various writings.

[52] On occasion, appeal is made to a passage in the explication of the Third Law of Nature (*Principles* 2, §40; AT 8:65: "I am not here inquiring whether human or angelic minds have a force to move bodies and of what kind [it might be], since I am reserving this for a treatise *On Man.*"), which only shows that Descartes was aware of the problem of interaction when he formulated his conservation law and saw no insurmountable difficulty. Also, in what can only be called a straightforward misreading of *Principles* 2, §36, Garber goes a step further, maintaining that "Descartes clearly admits that there *can* be violations of the conservation law, circumstances in which motion is added or taken away" ("Mind, Body and the Laws of Nature," 116). But the only support for such "violations" in the passage he quotes is the interpolation that he himself (115–16) adds in brackets, when he interprets "changes" in the *distribution* of motion among bodies to refer to changes in the *quantity* of motion in the world.

On the basis of Descartes's doctrine that preservation in existence is comparable to re-creation,[53] it is argued that God must be not only the ultimate but also the proximate cause of most or all motions. Since Descartes sees no "real distinction" between God's original creative activity and his current conservative activity, preservation is equivalent to continual re-creation. Kemp Smith argues that "[i]f finite bodies have so little hold on reality that they require at each moment to be recreated they cannot be capable of causing changes in one another."[54] Thus God recreates matter with successively different constellations of bodies according to the laws he has given himself. Occasionalism is taken to be the necessary consequence of the doctrine of divine concourse (*concursus dei*). Kemp Smith sees that these implications of God's concourse are incompatible with most of Descartes's writings and therefore accuses Descartes of inconsistency.[55] But this is a serious misreading.

(1) The fact that Descartes sees no "real distinction" between God's acts of creation and preservation is completely inconsequential. As the term is defined in the *Principles* (1, §60) there is no "real" or substantial distinction between any two properties of one and the same substance; such differences are either "modal" or "conceptual."[56] Thus, there is no real distinction between God's omnipotence and his wisdom, nor between my height and my weight. However, it by no means follows that the distinction between preservation and creation, whether it be modal or conceptual, is irrelevant to the foundations of physical science.[57]

(2) Nothing directly attributed to Descartes here is foreign to mainstream scholasticism, which did not embrace occasionalism.

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[53] See especially the third Meditation (AT 7:49; CSM 2:33).

[54] *Studies*, 73. For a refutation of the notion that God's *continuous* preservation is to be interpreted as a *discontinuous* "continual" repetition of discrete events, see Richard T. W. Arthur, "Continuous Creation, Continuous Time: A Refutation of the Alleged Discontinuity of Cartesian Time," *Journal of the History of Philosophy* 26 (1988): 349–75.

[55] *Studies*, 85. If material bodies are not taken by Descartes to cause our ideas of them, it is hard to make any sense of the *Meditations*, as Kemp Smith openly admits; see *New Studies in the Philosophy of Descartes* (London: Macmillan, 1966), 213–17.

[56] AT 8:28–30; see also the sixth Meditation and the reply to the first objection (AT 7:78 and 120; CSM 2:54, 86).

[57] Leibniz (GP 4:365) objected to Descartes's definition of real distinction because he thought it would lead to such misunderstandings.

Simply from the denial of a "real distinction" between the cause of becoming (*causa secundum fieri*) and the cause of continuing to exist (*causa secundum esse*) no such conclusion can be drawn: It is possible without any inconsistency to assert (1) that God is the source of everything material, (2) that nothing would continue to exist without God's conserving it in being, and (3) that material events are true *secondary* causes of other material events. This seems to be what Aquinas believed, and it is certainly what contemporary neo-scholastic philosophy asserts.[58]

(3) Moreover, even if these commentators were able to pin such consequences on mainstream Thomism, they would still be unsuccessful in pinning them on Descartes, because they have failed to understand the particular doctrine of *concursus dei* to which he is appealing. Descartes explicitly asserts that it is by his *ordinary* concourse (*concursus ordinarius*) that God conserves the quantity of motion in the world. He thus appeals to the conceptual distinction between the *ordinary* (or preserving) concourse and the *extraordinary* (or miraculous) concourse of God.[59] The fact that neither Kemp Smith nor those following him take any notice of this is perplexing to say the least. This is precisely the

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[58] See *Summa theologica* 1:104 and Walter Farrell, *A Companion to the Summa* (New York: Sheed & Ward, 1939–42), vol. 1, chap. 17.

[59] There seems to be some uncertainty about the translation of the term *concursus ordinarius*. In this context Kemp Smith (*New Studies*, 208) renders it "orderly [!] concourse"; Anscombe/Geach, "ordinary co-operation"; CSM, "regular concurrence"; Miller and Miller, "normal participation." Robert Boyle (*Works*, vol. 5, 163–64, 179) spoke in this context of God's "ordinary and preserving concourse"; and Samuel Clarke (and most scholars after him) translated Leibniz's *concours (extra)ordinaire* as "(extra)ordinary concourse." I shall follow them. See J. E. McGuire, "Force, Active Principles, and Newton's Invisible Realm," *Ambix* 15 (1968): 154–208, for examples of other English writers of the period who use the same term. The exact origins of the terminology are not entirely clear, though there is obviously some connection to the distinction between the absolute and regulated power of God (*potentia absoluta, potentia ordinata*). See Amos Funkenstein, *Theology and the Scientific Imagination from the Middle Ages to the Seventeenth Century* (Princeton: Princeton University Press, 1986), 124–52; Francis Oakley, *Omnipotence, Covenant and Order: An Excursion in the History of Ideas from Abelard to Leibniz* (Ithaca, N.Y.: Cornell University Press, 1984), 72–92. A pre-Cartesian use can be found in Francisco Suarez, *De arbitrii libertate*, chap. 5, §§20 and 28; *Opera omnia* (Paris, 1856), vol. 7, 31–33.

distinction that Leibniz later used in his debate with Newton and Samuel Clarke to keep God *out* of explanations of natural phenomena.[60]

Some commentators try to make Descartes consistent by limiting the scope of the conservation law and interpreting the rest of his philosophy as compatible with Kemp Smith's reading of the *Principles.* Hatfield, for instance, takes Descartes literally to have *derived* his physics from his metaphysics: the conservation of motion is entailed by God's immutability. But the immutability of God and his actions can then be taken really to imply the conservation of motion only if God produces all the motions himself. For, if bodies produced the motions of other bodies and God merely conserved the system of bodies as a whole, then changes might occur in the system without a change in God's act of preservation:

> for surely his act of preservation could be immutable, while the thing preserved could exhibit changing attributes (including the quantity of motion).[61]

Therefore, since Descartes believed that God's immutability entails the conservation of motion, he must have taken God as the proximate cause of every motion. However, leaving aside the question of what it means to say that God could preserve immutably a changing universe, this argument, if it were valid, would prove much too much; the same argument must, for instance, apply equally well to the number of human beings as to the quantity of motion. Since God originally put a certain number of human beings into the world (namely, two) and since he preserves the world just as he created it, then he must constantly conserve the same total number of human beings as he originally created—unless, of course, the number of humans does not belong to the identity conditions of the material universe. Only if having the same quantity of matter and motion is what makes the universe the same universe at different times must the constancy of God's operation guarantee their conservation. But this has to do with predicates of the universe, not of God.

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[60] See Leibniz's first letter to Clarke (GP 7:345); see also his letter to Arnauld, April 30, 1687 (GP 2:92) and *Causa dei* (GP 6:440).

[61] Hatfield, "Force," 122 n. 44.

5. Conclusion

Both objections to the Leibnizian interpretation of Descartes discussed above meet in the following point: If (1) human minds can originate motions, and (2) the conservation of motion is a law that God gives to himself to govern *his own* actions, not a law that he has given to matter, then the conservation law can still hold for those motions caused by God without constraining those caused by us. That is, God conserves *his* motions, not *ours*:

> Now, when God causes motion, the motion He causes must observe the conservation law. But there is no reason at all to impose similar constraints on *finite* and *imperfect* causes of motion. . . . *They* may add or subtract motion from the world, even if *God* cannot.[62]

But this just shows that with enough effort, projection, and speculation we can have Descartes's words without their content.

The "standard" interpretation sketches a Descartes who stipulates that the first proposition of a physical system must state the identity conditions of its object; the system must include definitions of what it means for a body to be in a particular state and what it means for that state to change, as well as laws governing the quantitative relations involved. When God is adduced, it is to provide (nonphysical) foundations for physics, not to undermine them. The alternative we have been offered by recent commentators is a Descartes who makes arbitrary and genuinely theological assertions about God's activity that neither constrain physical theory formation nor lead to any propositions about the material world except that it need not be causally closed. The interaction form of the modern mind-body problem is not only not solved, it is not even posed. Leibniz has offered us a Descartes who does bad physics but good metaphysics; recent commentators, while on occasion doing no little violence to the texts, offer us a Descartes whose metaphysics is worse than his physics. In spite of all the real difficulties involved in interpreting Descartes consistently, it seems preferable to take the strong philosophical position attributed to him by Leibniz, which is at least compatible with the texts. Given that Descartes's texts themselves often purchase consistency with vagueness, Leibniz offers us a way to make our interpretations precise and sensible in the context without loss of consistency or of philosophical substance. And that is really the point.

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[62] Garber, "Mind, Body and the Laws of Nature," 125; emphasis in original.

Universität Konstanz

Part VIII
Matter and Motion

[22]

History of Philosophy Quarterly
Volume 13, Number 2, April 1996

PERFECT SOLIDITY: NATURAL LAWS AND THE PROBLEM OF MATTER IN DESCARTES' UNIVERSE

Edward Slowik

In the *Principles of Philosophy,* Descartes attempts to explicate the well-known phenomena of varying bodily size through an appeal to the concept of "solidity," a notion that roughly corresponds to our present-day concept of density. Descartes' interest in these issues can be partially traced to the need to define clearly the role of matter in his natural laws, a problem particularly acute for the application of his conservation principle. Specifically, since Descartes insists that a body's "quantity of motion," defined as the product of its "size" and speed, is conserved in all material interactions, it is imperative that he explain how solidity influences the magnitude of this force. As a means of resolving this problem, Descartes postulated an idealized condition of "perfect solidity" which correlates a body's "agitation" force (a forerunner of Newton's concept of non-accelerating, or "inertial" motion) with the interplay of its volume, surface area, and composition of minute particles. This essay explores this often misunderstood aspect of Descartes' physics, as well as the special function of idealized conditions in his collision rules. Contrary to those commentators who regard "perfect solidity" as a stipulation on bodily impact, this notion, it will be argued, is primarily concerned with the internal composition of macroscopic bodies, and only indirectly with their collision characteristics. Along the way, many of Descartes' hypotheses will be shown to display a level of sophistication and intricacy that, despite their essential incompatibility, belie several of the common misconceptions of Cartesian science.

1. "PERFECT SOLIDITY" AND THE NATURAL LAWS

Among the ideal conditions that appear in his *Principles of Philosophy* (Pr II 37-52), Descartes remarks that his seven rules on the impact of material bodies "could easily be calculated . . . if [the two colliding bodies] were perfectly solid (*durus*). . ."(Pr II 45).[1] Although this stipulation was intended to assist in the application of the collision rules (as instances of his third natural law), the complex and puzzling concept of "perfect solidity," or "perfect hardness," is perhaps also notable for having generated several divergent interpretations among recent commentators. In some instances, "perfect solidity" has been translated into the modern dynamical locution "perfect elasticity," which denotes a class of material bodies that return to their original shape, volume, etc., after deforming under impact.[2] The translators of the first complete English edition of the *Principles,* V. R. Miller and R. P. Miller, for example, assume that Descartes had elasticity in mind in the passage quoted above.[3] While it is true that most commentators regard Cartesian bodies as "inelastically hard" (i.e., they do not alter their shape during collision), even a few of these scholars have been unable to resolve their doubts completely. For instance, R. S. Woolhouse has recently concluded that "since the 'before and after' of a perfectly hard collision is the same as the 'before and after' of a perfectly elastic one, there is some justification for the sometimes-made assumption that by 'hard' [solid] Descartes *really* means 'elastic'."[4] Notwithstanding the merits of this elastic/inelastic controversy, it would appear that such disputes overlook a more fundamental question that lies at the heart of the "perfect solidity" issue: Does Descartes' use of the "perfect solidity" concept encompass only the interactive, *collision* properties of bodies (i.e., how they behave under impact), or are other individual, non-interactive factors implicated as well, such as their internal composition and configuration of elementary particles? This essay presents the latter interpretation of perfect solidity, claiming that it constitutes the only means of correlating much of the information found in the latter portions of the *Principles* with the natural laws put forth in Part II. Despite its apparent connotations, "perfect solidity" pertains to the internal constitution of the basic particles that make up macroscopic bodies, and only indirectly the dynamic properties manifest in bodily collisions.

In order to demonstrate that Cartesian solidity is not merely a stipulation on bodily collisions, however, we will need to explore the interrelationship between the Cartesian conserved property of quantity of motion (often described as "size times speed") and the three bodily properties of volume, surface area, and quantity of matter. The specific function of these latter three properties is an issue that has received scant attention among Cartesian scholars, but it is crucial to a full understanding of Descartes' physics. For example, in the canonical presentation of the conservation law for the quantity of motion, Descartes' *Principles* specifically incorporates bodily surface area as a key factor in the determination of quantity of motion:

> We must however notice carefully at this time in what the force of each body to act against another or resist the action of that other consists: namely, in the single fact that each thing strives, as far as is in its power, to remain in the same state . . . . One which is at rest has some force to remain at rest, and consequently to resist everything which can change it; while a moving body has some force to continue its motion, i.e., to continue to move at the same speed and in the same direction. This force must be measured not only by the size of the body in which it is, and by the [area of the] surface which separates this body from those around it; but also by the speed and nature of its movement, and by the different ways in which bodies come in contact with one another. (Pr II 43)

Thus, the quantity conserved in the motion and impact of bodies, which Descartes refers to as "quantity of motion," is determined by three factors: size, surface area, and speed (where speed is conceived as a non-directional scalar property, unlike velocity). Although the role of surface area is not revealed at this stage in the *Principles,* the derivation of his natural laws in Part II apparently equates a body's size with its volume, and its quantity of motion with the product of its size and speed (e.g., "when one part of matter moves twice as fast as another twice as large, there is as much [quantity of] motion in the smaller as in the larger" Pr II 36.). Given his thesis that spatial extension (in three dimensions) constitutes the essential property of material substance (Pr II 11), it is probably not surprising that the alleged identification of Descartes' term 'size' with 'volume' is often accepted as an elementary fact of Cartesian science.[5] Nevertheless, it is also true that Descartes' conservation law implicates both size *and* surface area in the determination of quantity of motion, two properties whose exact interrelationships, and hence contribution to the conservation law, are never clearly detailed in the Cartesian theory of matter.

The problem of harmonizing Descartes' sporadic references to surface area, volume, and quantity of matter with his principal use of the term 'size' has long been a source of irritation among Cartesian scholars. Many who are aware of the ambiguous contribution of Cartesian matter to the natural laws have only mentioned this difficulty in passing, since their main research concerns others aspects of Descartes' physics. To illustrate, in an important essay on Cartesian force, M. Gueroult's only reference to these issues is the observation that "the notion of mass identified with volume remains very obscure in Descartes."[6] In other cases, scholars will draw attention to the imprecise meaning of Descartes' term by placing it in quotation marks (i.e., 'size'), as does A. Gabbey in the following: "for Descartes, . . . the force of motion of a body, . . . is the product 'size' × speed . . . ."[7] Overall, the sentiment of many of these Cartesian researchers is probably best captured by D. M. Clarke's remark that "the details of [Descartes'] theory are never sufficiently developed, so that one finds the same rather vague references to size, surface area, resisting media, and speed . . . ."[8]

Nevertheless, the details of Descartes' theory are less vague than most commentators have assumed. To demonstrate this point, Sections 1.1 through 1.4 will examine how the bodily properties of volume, surface area, and quantity of matter are integrated by Descartes' concept of perfect solidity. On the basis of this discussion, we will then return, in Section 1.5, to the question posed at the outset: i.e., Is "perfect solidity" chiefly a collision, or composition, property of macroscopic bodies? Perfect solidity may have other applications, however, especially with respect to the interactions of bodies that operate outside of the special conditions of the impact rules. Thus, Section 2 will examine various methods of utilizing the perfect solidity concept to resolve the problems that arise under these non-idealized conditions. The Cartesian concept of "rigidity", which will be introduced in Section 2.2, will also be seen to have important repercussions for our discussion in Section 1.5, providing further reasons for regarding perfect solidity as primarily a stipulation on bodily composition.

1.1. Rarefaction and Condensation

Descartes' definition of solidity first appears in Part II of the *Principles,* Articles 54: "Those bodies whose particles are all contiguous and at [relative] rest, are solid." In this passage, "contiguous" is the term requiring further elaboration, since the appeal to the "relative rest" of the particles pertains to Descartes' rejection of a binding force among the infinitely-divisible particles of matter (Pr II 20, 55). Essentially, Descartes treats the observed phenomenon of varying bodily density, or, as he phrases it, "solidity," through an appeal to the spaces between the particles of matter. With respect to those processes which either decrease or increase the size of material bodies (labeled, respectively, rarefaction and condensation), he states: "rarefied bodies are those with many spaces between their parts which are filled by other bodies. And rarefied bodies only become denser when their parts, by approaching one another, either diminish or completely eliminate these spaces . . ." (Pr II 6). Thus, bodies whose particles are contiguous (i.e., they are not separated by an influx of foreign matter) are deemed "solid." Descartes evidently found these natural processes of varying density rather disturbing, for they "might lead one to doubt whether the true nature of body consists in extension alone," a remark that also explains their presence at so early a stage in the *Principles*. Yet, only in Part III, 48-52, are we first introduced to the hierarchy of material elements responsible for the swelling and shrinking of these large macroscopic bodies. Briefly, Descartes procures a threefold subdivision of matter in order to explicate the underlying mechanisms that operate his matter-filled, or plenum, world. These basic particles, largely differentiated by size and function, are: (i) the large, macroscopic third elements of matter, and (ii) the much smaller, globule-shaped second elements of matter; while the minute debris formed from the collisions of the second and third elements, known as (iii) the first elements of matter, serve to fill the lacunae manifest between these larger particles.

In Part III of the *Principles,* Descartes presents a somewhat more elaborate analysis of the problem of solidity. Quite possibly, he felt compelled to furnish a systematic explanation of this phenomenon after reflecting upon the variety of diverse behavior produced by identically-sized bodies in resisting or sustaining motion—behavior which today we would call inertial effects. That is, there often exists a disparity among bodies of the same spatial volume, such as two identically sized globes composed, respectively, of gold and wood, in resisting changes to their states of motion. (E.g., one is much harder to move than the other!) One of the principal motivating factors in the formulation of the Cartesian theory of solidity is the need to explicate the origin of these "inertial" effects (although Descartes would not have used this term). In fact, a discussion of the motions of celestial bodies occasions Descartes' next attempt at a definition: "the solidity of [a] star is the quantity of the matter of the third element, . . . in proportion to its volume and surface area" (Pr III 121). As defined, solidity is thus a function of three variables: quantity of third element matter, surface area, and volume. Since the distinction between these three quantities, and their role in affecting density, is often misunderstood, we shall examine this three-part interrelationship below.

1.2. Volume, Quantity of Matter, and the Agitation Force

At one point in the examination of solidity, Descartes utilizes his ratio of quantities to resolve the problem, just described, of divergent motions that originate from bodies of equal volume. He explains:

> Thus, here on earth, we see that, once moved, gold, lead, or other metals retain more agitation, or force to continue in their movement, than do pieces of wood or rocks of the same size and shape; and consequently metals are also thought to be more solid, or to contain more matter of the third element and smaller pores filled with the matter of the first and second elements. (Pr III 122)

Descartes' remarks contain an implicit conjecture on the origins of inertial effects (although, as previously noted, Descartes did not hold the modern concept of inertia):[9] A body's "force to continue in its movement," or "agitation," is directly proportional to its amount of third element matter. Therefore, provided two bodies of equal volume (and equal speed), the more solid object will possess the greater quantity of third element matter, and consequently produce a greater tendency to continue in its motion (or agitation). This interpretation of the passage is verified by his discussion of the motions of stars: "The force which [a star] acquires from its motion . . . to continue {to be thus transported or} to thus move, which I call agitation; must be estimated neither by the size of its surface area nor by the total quantity of matter {which composes it}, but only by the quantity of the third element matter . . ." (Pr III 121). In Part II, furthermore, a moving body's "quantity of motion" (or "size times speed") constitutes a measurement of its "force to continue its motion, i.e., to continue to move at the same speed in the same direction" (Pr II 43); which is the same description Descartes provides for his force of agitation in Part III (see Section 1). Quantity of motion is hence a gauge of agitation force, a conclusion that will later assume importance.[10]

At this juncture, one may begin to question the overall consistency of combining Descartes' agitation force hypothesis with his theory of matter. If, as Descartes believes, matter is mere spatial extension, then why should the agitation force of, say, a body entirely composed of tertiary matter differ from that of a body (of equal volume) containing only first element matter? Since all matter is extension, it would seem that both bodies should behave in exactly the same manner. Descartes, however, is quick to provide a rationale for this association. He reckons that, because the individual motions of a collection of elementary particles are not entirely unified, a volume of secondary globules cannot produce an agitation force equal to that of an identical volume of tertiary matter. In an insightful passage concerning stellar motion, he compares the agitation force of a star composed of third element matter against the force produced by an equal volume of secondary globules:

> Because these globules are separated from one another and have various {individual} movements; although their united force acts against the star, they cannot all unite their force simultaneously in such a way [as to ensure] that no part of their force is wasted. In contrast, all the matter of the third element . . . forms one single mass which is moved together as a whole, and thus all the force which it has to continue in its motion is applied in a single direction. (Pr III 124)

Put simply, the variably-directed motions of the individual globules of secondary matter (and, presumably, first element matter) lessen the total agitation force of the composite volume *in any single direction.* The motion of the star is not subject to these same effects, on the other hand, since all of the matter of third element constitutes a unified whole which moves in a single direction. Therefore, it is not the case that tertiary matter possesses some internal property that makes it qualitatively different from the other material elements; rather, it is simply the relative rest of the particles that comprise the third element which account for its role in determining the agitation force of *macroscopic* bodies, such as stars. Since the three types of Cartesian matter are identical in all respects except their relative size, Descartes' agitation theory is thus also applicable to particles entirely composed of primary and secondary matter. For instance, among secondary particles, the globules that possess more secondary matter will harbor the greater agitation forces (as will be evident in later sections).

Although Descartes' reasoning is rather ingenious, it does not entirely justify his correlation of a macroscopic body's agitation force with its quantity of third element matter. For, even if the individual motions of the first and second elements cannot simultaneously unite their forces in a single direction "in such a way [as to ensure] that no part of their force is wasted," it is still the case that they will contribute some force, albeit small, in that given direction. The force generated by these particles will probably be insignificant in comparison to the force provided by the tertiary matter, but it is still a distinct force, and thus it must make some contribution to the overall agitation force of the composite body (i.e., the star). In fact, Descartes seems to admit this interpretation of his theory: "As for the matter of the first or even the second element, it is continually leaving [a] star and being replaced by new matter. Consequently, this new matter approaching cannot retain the force of agitation acquired by the matter which has already left, which, in any case, was very small" (Pr III 121). If, as Descartes concedes, the departing first and second elements have acquired a force of agitation from the star, then this acquired force must have contributed something to the star's total quantity of motion, a force these particles obtained while inside the star. On this rendering of the evidence, it thus appears that a Cartesian body's agitation force should be equated with its total quantity of matter, and not just its quantity of third element matter.

It is unfortunate that Descartes did not adequately explain his reasons for disregarding the contribution of the primary and secondary elements to the agitation force of macroscopic bodies, but his brief statements may indicate two possible motives for this decision. First, as specifically mentioned in the quotation above, the primary and secondary elements of matter are continuously leaving a star and being replaced by new matter. Hence, these minute particles are best seen as foreign bodies that only temporarily occupy the macroscopic host body, and do not assist in the composition of that body. Of course, if these foreign particles do not qualify as constituent members, then the effects of their individual agitation forces on the host body can be ignored. This interpretation has the added bonus of nicely correlating with a claim made early in Part II: "whatever extension there is in the spaces between [a body's] parts must in no way be attributed to it, but to whatever other bodies fill those spaces" (Pr II 6). Nevertheless, it should be noted that this form of response does not sit well with Descartes' definition of an individual body; where "by *one body,* or *one part of matter,* I here understand everything which is simultaneously transported; even though this may be composed of many parts which have movements among themselves" (Pr II 25). As for the second possible rationale, since Descartes holds that the agitation force acquired by the first and second elements is "very small," he may believe that this minute quantity can be conveniently ignored when determining the body's overall agitation force. In other words, one can secure a fairly accurate approximation of a body's quantity of motion by simply taking the product of its total quantity of tertiary matter and speed. Regardless of which construal of Descartes' reasoning we adopt, his correlation of agitation force and third element matter in the case of macroscopic bodies remains somewhat obscure; but it will assume great importance below (in Section 2.2) when we discuss the impact of such composite bodies.

1.3. Surface Area and the Agitation Force

Besides quantity of tertiary matter, a body's agitation force is also substantially influenced by the magnitude of its surface area. On the whole, Descartes is well aware that the agitation force of a body can be modified by simply changing its shape. For instance, a golden sphere can assume shapes that will allow a less-dense wooden sphere to possess a "greater agitation; . . . if [the golden sphere] is drawn out into threads or {forged} into thin plates or hollowed out with numerous holes like a sponge, or if it in any other way acquires more surface area, in proportion to its matter and volume, than the wooden sphere" (Pr III 122). In this case, the magnitude of an object's surface area is clearly implicated in the resulting agitation force: The larger the proportion of surface area to third element matter, the smaller the resulting force. This formula likewise holds for the individual globules of secondary matter. In discussing the agitation force of various sized globules, he argues that "the smaller [globules] have {less force, because they have} more surface area {in proportion to the quantity of matter} . . . than the larger ones . . ." (Pr III 125).

Yet, the relationship between surface area and quantity of matter in Cartesian natural philosophy is a rather complex affair, and possibly uncertain. As quoted above, Descartes claims that a star's agitation force is a sole function of its quantity of third element matter, with surface area playing no role. In the very next article, though, he openly admits that a body's surface area can greatly change the magnitude of its agitation force. Contradictions of this sort bedevil much of the Cartesian theory of solidity and agitation, which provides a possible explanation for their lack of serious coordinated analysis. In essence, Descartes seems to desire a simple correlation between a body's agitation force and its quantity of second or third element matter; but, he also recognizes the important role of surface area in modifying this force, a variable he cannot completely ignore.

Descartes' uncertainty regarding the role of surface area is a dilemma that can be traced back to the definition of quantity of motion in Part II. On the whole, Descartes was cognizant of the plenum's capacity to retard the motions of bodies: "It is obvious, moreover, that [bodies] are always gradually slowed down, either by the air itself or by some other fluid body through which they are moving . . ." (Pr II 38). If we conjoin this observation with Descartes' comments on the motions of various shaped material objects (as noted above), then it seems plausible to infer that Cartesian surface area merely functions to *change* a body's existing agitation force, rather than assist in *constituting* that force. More carefully, a large surface area "slows down" a moving body by increasing the number of plenum particles it encounters along its path: the greater the magnitude of the body's surface area, the more particles it will confront (as opposed to a smaller shape), and hence the more quantity of motion it will lose or transfer to the surrounding plenum.[11] This interpretation of the role of surface area in Descartes' physics has been duly noted by R. S. Westfall: "Descartes asserted frequently that the quantity of surface on which other bodies can impinge modifies the force of a body to continue its motion" (*ibid.,* 70). This realization most likely prompted Descartes to incorporate surface area into his definition of the quantity of motion, the force that is conserved in all bodily collisions (as quoted in Section 1). "This force must be measured not only by the size of the body in which it is, and by the [area of the] surface which separates this body from those around it; but also by the speed and nature of its movement . . ." (Pr II 43).

Nevertheless, the prospects of "quantifying over" the retarding effects of surface area must have presented a serious obstacle to the formulation of the Cartesian conservation law. Prior to the analysis of the collision rules, and *just after* his definition of quantity of motion, Descartes strives to eliminate this extra variable by insisting that his "[colliding bodies are] separated from all others {both solid and fluid} in such a way that their movements would be neither impeded nor aided by any other surrounding bodies . . ." (Pr II 45). Accordingly, with the aid of this additional idealized condition, it is no longer necessary to take into account a body's particular shape when calculating its quantity of motion. In the presentation of the collision rules, the mitigating effect of surface area on the agitation force has been ruled out by definition, thus explaining its conspicuous absence in the derivation of these seven hypotheses.[12] Yet, Descartes' ideal conditions only prevail for the collisions depicted in this section of the *Principles.* In Part III, the reemergence of surface area as a factor in the motions of bodies clearly indicates that such conditions are no longer in effect. It is a general mistake, therefore, to disregard the influence of surface area when ascertaining a body's quantity of motion outside the context of the idealized conditions utilized in the collision rules.

1.4. Agitation and Solidity: Towards a Synthesis

In determining the factors involved in Descartes' agitation theory, we have examined thus far the functional relationship between surface area and quantity of matter, and between volume and quantity of matter; but the exact means by which all three quantities are integrated into a single concept or formula remains largely unexplained. Fortunately, in a discussion of the mitigating effects of surface area on a star's agitation force (relative to the agitation force of secondary globules), Descartes provides an outline of this three-part interrelationship:

> It can happen that [a star] has less solidity, or less ability to continue its movement, than the globules of the second element which surround it . . . . For these globules, in proportion to their size, are as solid as any body can be, because we understand that they contain no pores filled with other . . . matter; and because their figure is spherical; the sphere being the figure which has the least surface area in proportion to its volume . . . . (Pr III 123)

In this two-part analysis, Descartes essentially provides the clearest formulation of his theory of solidity, and of the means by which a body's agitation force is linked to its solidity. With respect to his first claim, a globule completely packed with (secondary) matter is more solid than any other globule of identical size; where, as exercised in this quotation, the notoriously obscure term "size" apparently denotes volume. That is, without pores filled with matter (presumably first element), these globules are fully condensed (as defined above), and thus possess the highest degree of solidity. Given the earlier reference to the solidity of stars, it is safe to assume that this account of solidity must also hold for bodies entirely composed of tertiary matter, rather than just the globules composed of secondary matter. As a result, we can translate the expression "contiguous" in Descartes' first definition of solidity with the degree of bodily porosity. For the second part of his definition, Descartes claims that a spherical body is more solid than any other *figure* of the same "size" (volume), since the sphere manifests the smallest proportion of surface area to volume.[13] Presumably, these identically-sized objects possess a similar quantity of second or third element matter; for, if they did not, a highly rarefied spherical body could conceivably retain more solidity than a fully condensed non-spherical body of similar volume, in direct violation of the first part of the definition. We can generalize this section of Descartes' hypothesis as follows: provided two bodies of identical volume and identical quantities of third element matter (or second, if it is a globule), the body possessing the smallest surface area will harbor the greatest agitation force. Therefore, inasmuch as agitation force is linked to solidity, our three quantities—volume, surface area, and quantity of matter—are essential ingredients in the magnitude of this force.

All told, at least one important lesson can be extracted from Descartes' complex and troublesome theory of solidity: Any attempt to simply identify a body's quantity of motion with its volume and speed, as seemingly implicated in the definition of quantity of motion, is inconsistent with the analysis of solidity offered in Part III. Given our analysis, it is thus evident that, *if used outside of the context of the idealized collision rules,* quantity of motion tacitly expresses an intricate relationship between a body's volume, surface area, and its total quantity of second or third element matter (besides speed). In various circumstances, these variable magnitudes determine the agitation force, and hence quantity of motion, of all physical bodies in the Cartesian plenum. In other words, inasmuch as agitation or quantity of motion are directly dependent upon our three quantities, the theory of solidity presented in Part III informs and governs the operation of the conservation law under the normal, non-idealized conditions that prevail in the Cartesian plenum. Most expositions of Descartes' laws of nature do not disclose or investigate this important aspect of the *Principles,* but it is crucial to a full understanding of Cartesian dynamics.[14] In fact, one can find in the Cartesian literature numerous attempts to isolate spatial volume, or quantity of matter, as the sole contribution of Cartesian matter to the conservation law (size times speed).[15] Yet, these readings of quantity of motion only hold for the highly idealized conditions assumed in the collision rules; where, as discussed in Section 1.3, the role of surface area in modifying the agitation force has been negated by Descartes' exclusion of disrupting plenum effects.

1.5. Perfect Solidity and the Natural Laws: A Proposal

We can now return to the analysis of the impact behavior of Descartes' "perfectly solid" bodies, which has been the motivating cause of our lengthy investigation. As we have seen, Descartes couples the agitation force to an intricate relationship among three different bodily quantities. Provided this theory, it would seem an almost impossible task to secure a systematic *quantitative* description of the inertial tendencies and conserved motions of material bodies. In order to produce such a law, one would need to determine the exact means by which the relative proportions of quantity of matter, volume, and surface area, contribute to the overall conserved motions of the colliding system. Yet, rather than undertake these potentially unrealizable determinations, Descartes circumvents the problem by (1) simply confining the scope of his collision laws to the impact of completely solid bodies, and (2) ignoring the plenum's capacity to retard bodily motion via bodily surface area. More precisely, if the globule or body is fully condensed (contains no pores), then it embodies as much second or third element matter (respectively) as its volume permits. No longer is it necessary to compute the ratios of quantity of matter to total bodily volume among the colliding bodies—under this requirement, all that is obligated is a measurement of their relative bodily volumes. In addition, without the need to consider surface area, a body's total quantity of second or third element matter, or volume (given perfect solidity), can now be conveniently equated with its agitation force (after taking its product with speed, of course). It is thus no longer necessary to calculate how different shapes affect the quantity of motion of bodies with identical volume.

As utilized in the collision rules (Pr II 46-52), the requirement for perfect solidity can be therefore largely viewed as a stipulation for completely dense, pore-less bodies. That is, provided the evidence of the entire *Principles,* Descartes' appeal to perfect solidity partially amounts to a restriction on the potential ratio of a colliding body's quantity of matter to its total volume. The motivation underlying this restriction stems from the obvious need for a simplified and manageable treatment of the variables influencing a body's agitation force, and hence quantity of motion. As mentioned at the outset, despite the strong dynamic connotations, perfect solidity is *not* a requirement exclusively allied with the impact behavior of material bodies—other non-interactive properties, such as internal composition, form an important part of this concept.

Put slightly differently, one can view perfect solidity as "an attempt to isolate behavior that can be regarded as fundamental given Descartes' metaphysics of matter," as J. Carriero has recently suggested.[16] Since Cartesian matter is pure extension, the perfect solidity criterion frees the collision rules from the internal complications—via elementary particles—that beset the interactions of most macroscopic bodies (see Section 1.2). Without the need to factor in these interfering effects, perfect solidity thus allows the collision rules to describe the "pure" or "actual" collision behavior of Descartes' extended bodies. However, even on this interpretation (which is complimentary to the one advanced here), perfect solidity still remains primarily a stipulation on bodily composition, and not a description of how bodies *behave* during impact (e.g., by losing and regaining their original shape, or completely reversing their direction of motion). Of course, there is a sense in which any specification of the composition of bodies is relevant to their collision properties, due to the simple fact that a body's constitution affects its interactions. But, bodily composition does not directly outline or detail such interaction behavior: rather, bodily composition, i.e., perfect solidity, is only indirectly concerned with the outcomes of bodily impact. In the next section, the analysis of the concept of "rigidity" will further substantiate this rendition of Descartes' perfect solidity concept.

2. NON-IDEALIZED CONDITIONS AND THE NATURAL LAWS

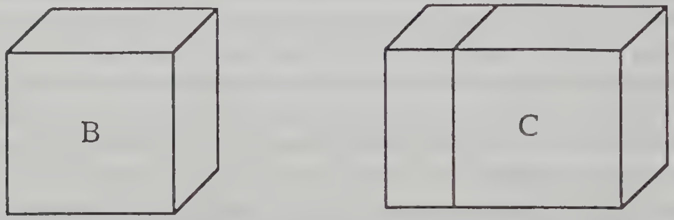
This section examines the prospects of successfully applying the Cartesian conservation principle without relying on the highly idealized conditions presupposed in the collision rules; that is, without limiting the scope of the natural laws to the interactions of just poreless bodies. As will become evident, many facets of Descartes' theory of matter and motion can generate substantial difficulties for this undertaking. Nevertheless, we will consider various methods of utilizing the insights gained from our study of Cartesian solidity, and of our forthcoming analysis of Cartesian rigidity, to overcome these obstacles.

2.1. The Problem of Size Invariance

Besides definitional or computational simplicity, there may exist an aspect of Descartes' solidity hypothesis that specifically concerns the effects of bodily motion and impact. To demonstrate this point, we need to investigate the origins of Descartes' plenum universe. According to the Cartesian cosmological hypothesis, all space (matter) was initially divided into homogeneous parts of equal size, and impelled with a conserved quantity of motion: "God, in the beginning, divided all the matter of which He formed the visible world into parts as equal as possible and of medium size . . . . [Also] He endowed them collectively with exactly that amount of motion which is still in the world at present" (Pr III 46). Eventually, the collisions of these equally-sized spatial parts formed the three Cartesian elements of matter, as well as the vast diversity of material bodies comprised from these elements. The initial impact of Cartesian matter could not have been elastic, consequently, because of the absence of the fragmented particles necessary for the composition of porous bodies. Without pores, the original bodies in Descartes' universe were perfectly solid. Yet, these bodies were clearly not perfectly solid in the sense required for Descartes' collision rules, since their impact ultimately resulted in a loss of size through fragmentation. When objects disintegrate or shed particles in this manner, their total quantity of motion will inevitably decrease.[17] More specifically, macroscopic bodies that do not possess determinate volumes do not possess determinate quantities of motion, which is defined as the product of speed and size (or volume, recalling the interdependence of these concepts as discussed above). Of course, a Cartesian will probably insist that any lost quantity of observable bodily motion is merely transferred to the realm of the surrounding microscopic particles, thus preserving the total universal quantity of motion. This form of response, although possibly correct, does not remedy the plight of Descartes' collision rules, however. If the Cartesian collision rules are to be applied successfully *at the level* of macroscopic objects, it is necessary that they conserve the total *bodily* quantity of motion by maintaining an invariant magnitude of bodily size. Hence, besides the absence of bodily pores, Descartes' perfect solidity criterion may also be interpreted as sanctioning a property of unchanging bodily size (or volume).

Moreover, the union of the Cartesian theory of matter with a plenum universe poses major obstacles for the successful application of the Cartesian conservation law. This conflict probably stems from Descartes' denial of a material binding force; for when this theory, that relatively resting particles constitute solid bodies, is conjoined with any explication of bodily motion in a plenum, it becomes very difficult to accommodate the further contention that moving objects do not change volume over time. If the particles that comprise a solid object are at rest (relative to one another), the force exerted by the surrounding bodies and particles during motion, let alone impact, would seem quite sufficient to dislodge large numbers of them. Accordingly, over a given temporal interval it may be impossible to posit a determinate volume for any moving Cartesian body. Yet, solid bodies that persistently shed minute particles as they travel and collide will experience a decrease in their quantity of motion with their corresponding reduction in volume, once again presenting great difficulties for any attempt to apply the Cartesian law to the collisions of macroscopic bodies over any temporal span.

Evidence may exist, furthermore, to support the contention that the lack of a material binding force influenced Descartes' view of impact. In the illustrations of colliding bodies that accompany the letter to Clerselier, dated 17 February 1645, it is potentially significant that the cubes in one of Descartes' pictures possess equally sized rectangular surfaces on their sides of collision: i.e., the collision or contact surfaces of the two cubes are congruent (see the figure below).[18] Provided the Cartesian denial of binding forces, this congruence may amount to a logical or practical consideration, for there would seem no means of preventing larger cubes from breaking apart (on contact with smaller cubes) without equal contact surfaces.[19] For example, if the collision surface of a cube C extends beyond that of a second cube B, many particles on the periphery of C's surface will not encounter any opposing B particles upon impact, and thus continue their motion past the contact surface (resulting in C's disintegration). That the prospects for such incidents may have troubled Descartes is also disclosed in his letter to Clerselier. In picturing the collision of two unequally sized bodies, he merely increases the length of one of the cubes while preserving the congruence of their contact surfaces. If this interpretation of Descartes' illustrations is correct, then we can add a further stipulation to the ideal condition for perfect solidity; namely, that two bodies manifest identical impact surfaces.



Descartes' depiction of two unequally sized bodies in his letter to Clerselier (this is a slightly simplified version of the original). Note that both B and C are situated so as to collide upon sides possessing congruent surfaces.

This construal of the Clerselier illustrations faces problems, nonetheless. With respect to these same collisions (among objects of different size), a second drawing included in the Clerselier letter does not display identical contact surfaces, nor do any of illustrations contained in the *Principles* (see, Pr II 45-52). In addition, it is not clear just how congruent contact surfaces can prevent the disintegration of colliding Cartesian bodies. As previously discussed, if relatively resting particles are prone to separate when confronted by an external material agent, then the forces exerted by the numerous plenum particles would seem quite sufficient to disperse a Cartesian body even when it is not impacting. In essence, congruent contact surfaces will not compensate for the lack of a material binding force.

2.2. Rigidity

In order to further examine the application of Descartes' conservation law to the impact of plenum bodies, it will be necessary to explore the Cartesian concept of "rigidity," a notion that essentially constitutes a theory of elasticity. Towards the end of Part IV (on terrestrial phenomena), he states:

> Glass is rigid: that is to say, it can be somewhat bent by external force without breaking but afterwards springs back violently and reassumes its former figure, like a bow. . . . And the property of springing back in this way generally exists in all hard bodies whose particles are joined together by immediate contact rather than by the entwining of tiny branches. For, since they have innumerable pores through which some matter is constantly being moved . . . , and since the shapes of these pores are suited to offering free passage to this matter . . . , such bodies cannot be bent without the shapes of these pores being somewhat altered. As a result, the particles of matter accustomed to passing through these pores find there paths less convenient than usual and push vigorously against the walls of these pores in order to restore them to their former figure. (Pr IV 132)

On Descartes' estimation, a "rigid" body is capable of returning to its original configuration after impact due to the action of matter, presumably first element, contained within its pores. These primary elements of matter recover the body's initial shape by pressing against the walls of the pores during the contraction of impact. Cartesian rigidity, the analogue of elasticity, thus stands in sharp contrast to the Cartesian definition of solidity: the former concept invokes pores or channels within the structure of material bodies, while the latter notion requires fully condensed bodies completely devoid of such conduits. To verify this material classification, one needs only to recall Descartes' synopsis of the completely solid secondary elements: "these globules, in proportion to their size, are as solid as any body can be, because we understand that they contain no pores filled with other . . . matter" (Pr III 123). Without pores, Cartesian bodies are thus incapable of changing and regaining their bodily shape under impact. Needless to say, these comments make it abundantly clear that, contrary to the suggestions of some commentators, Descartes did not intend perfect solidity to mean perfect elasticity.

In addition, by confidently asserting that rigidity "generally exists in all hard bodies," Descartes' exposition on elastic phenomena makes it clear that most physical bodies are not perfectly solid. One must exercise caution in interpreting this claim, however, since the standard explications of the terms "hard" and "rigid" somewhat overlap: Descartes is not claiming that all bodies, including the perfectly solid ones, are elastic (rigid); rather, he is merely pointing out the non-trivial fact that most *seemingly* perfect solid bodies are actually elastic. On a deeper level, one may in fact read into his statement a denial of the very existence of perfectly solid bodies. Descartes' observations thus reflect and corroborate the tacit assumption that perfect solidity is an *ideal condition* imposed on the domain of his conservation laws. Furthermore, as an historical aside, Descartes' analysis of rigidity belies the simplistic judgment that all Cartesian bodies are inelastically hard. On the contrary, his comments reveal an intuitive awareness of the fundamental elasticity of most, if not all, macroscopic objects; a conclusion closely akin to the later elastic theories of Leibniz and John Bernoulli.[20]

Returning to the problem of implementing the conservation law, it is important to note that the utilization of Descartes' hypothesis concerning tertiary matter and the agitation force, first introduced in Section 1.2, greatly assists in conserving the quantity of motion of colliding "rigid" bodies. As mentioned, rigid bodies possess pores or channels filled with elementary particles of matter, particles whose presence or absence occasions the phenomena of rarefaction and condensation. When these elastic bodies collide, consequently, it would seem that many of the small foreign particles housed in the objects, i.e., the primary and secondary matter, must be expelled or ejected during the contraction phase of the impact (when the distortion of the body during the brief instants after contact compresses its pores). Because of the Cartesian identification of matter and space, only by emitting matter can the body reduce the volume of space it occupies. Likewise, the primary and secondary elements of matter will somehow need to filter back into the object after the contortion phase of the impact to "puff" it back up to its original size. The exact manner by which this process takes place is decidedly unclear given Descartes' brief comments on the problem of elasticity—presumably, some sort of "hinge" mechanism on the surface of porous bodies could be invoked to meter the flow of particles both in and out of the channels. Nevertheless, if we adopt Descartes' correlation of tertiary matter and agitation force, then one aspect of "rigid" collisions is evidently clear: the reduction and increase in a body's overall volume during the temporal period spanned by an elastic collision will not vary its total quantity of motion, since all the particles ejected and recovered will not be third element matter. Descartes' stipulation of an "agitation" force, a theory that seemed somewhat unmotivated when first presented (in Section 1.2), thus proves invaluable in applying the conservation law to the collisions of the normal, non-idealized bodies that predominate in the Cartesian plenum (i.e., rigid bodies).

CONCLUSIONS

Finally, we should offer some concluding remarks on the success of Descartes' project. With the benefit of scientific hindsight, Descartes' decision to formulate his laws of motion upon the groundwork of his theory of matter was rather unfortunate. His conservation principle, which demands a firm material theory to operate effectively, is severely handicapped by the quirks of his physical program; most notably, by the interference of the plenum and the lack of a material binding force. In short, it seems impossible to integrate all of the Cartesian theories surveyed in this essay into a coherent system of dynamics. Yet, this conclusion should not be taken to invalidate or lessen the value of Cartesian natural philosophy, since the very influence of Descartes' work on the succeeding generations of scientists is enough to dispel this simplistic notion. The ideal condition of "perfect solidity," the main focus of our investigation, is a case in point: although the solidity thesis harbors various inconsistencies, it exhibits a striking awareness of the diverse factors involved in the inertial motion of bodies, as well as offering a sophisticated attempt at integrating these disparate elements into a single manageable formula. Despite its history of neglect, much can be learned from studying the intricacies and interrelationships of Descartes' theories of solidity, rigidity, and agitation.[21]

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Received September 18, 1995

NOTES

1. R. Descartes, *Principles of Philosophy,* trans. by V. R. Miller and R. P. Miller (Dordrecht: Kluwer Academic Publishers, 1983). Translations are based on the Miller and Miller but are checked against the Adam and Tannery edition of the *Oeuvres de Descartes* (Paris: Vrin/C.N.R.S., 1976). I will identify passages according to the standard convention: thus, Article 15, Part II, of the *Principles* will be labeled "Pr II 15." Passages in brackets, { }, indicate additions made to the French translation of 1647.

2. "The property of recovery of an original size and shape is the property that is termed *elasticity.*" A. E. H. Love, *A Treatise on the Mathematical Theory of Elasticity* (New York: Dover, 1944), p. 92. However, the term 'elastic' receives various interpretations. E. J. Aiton reasons, for example, that a body is elastic only if it rebounds in the opposite direction (while presumably recovering its initial shape) "Descartes term 'hard' . . . cannot be equated with 'elastic,' since the hard bodies sometimes rebound and sometimes move together." E. J. Aiton, *The Vortex Theory of Planetary Motions* (MacDonald: London, 1972), p. 39. Consequently, Aiton interpretes "perfect solidity" as a dynamic, or collision, property of bodies.

3. See, Miller and Miller, in Descartes, 1983, p. 64, fn. 44.

4. He continues: "There is good reason for Descartes to have considered perfectly hard [solid], perfectly elastic bodies, for when soft and perfectly inelastic bodies collide the 'quantity of motion' is not conserved." R. S. Woolhouse, *Descartes, Spinoza, Leibniz: The Concept of Substance in Seventeenth Century Metaphysics* (London: Routledge, 1993), p. 114. For a recent example of an "inelastically hard" reading, see, D. Garber, *Descartes' Metaphysical Physics* (Chicago: Chicago University Press, 1992), p. 357.

5. Rohault's influential Cartesian text of the late seventeenth century provides a nice example of the contribution of bodily "volume" to quantity of motion: "If a body of *two Cubic Feet* runs through a Line *sixty Foot long,* it has twice as much Motion, as a Body of one *Cubic Foot,* which runs through the same Line . . . ." J. Rohault, *A System of Natural Philosophy, vol. 1* (written 1671), trans. J. Clarke and S. Clarke (1723), (New York: Johnson Reprint Corp., 1969), p. 43.

6. M. Gueroult, "The Metaphysics and Physics of Force in Descartes," in S. Gaukroger, ed., *Descartes: Philosophy, Mathematics, and Physics* (Sussex: Harvester Press, 1980), p. 228, fn. 100.

7. A. Gabbey, "Force and Inertia in the Seventeenth Century: Descartes and Newton," in S. Gaukroger, ibid., p. 245.

8. D. M. Clarke, *Descartes' Philosophy of Science* (Manchester: Manchester University Press, 1982), p. 217. Clarke is certainly aware of the function of perfect solidity, however, as I will later comment

9. For a thorough comparison of Descartes' and Newton's theories of inertial motion, see, for example; A. Gabbey, *op. cit.,* pp. 230-320.

10. As R. S. Westfall has pointed out, there is a great deal of ambiguity in Descartes' use of the term 'agitation.' Yet, Westfall agrees that this term seems to signify 'momentum' (or quantity of motion, if its a scalar property) in the articles on the motions of stars in Part III of the *Principles.* See, R. S. Westfall, *The Concept of Force in Newton's Physics* (London: MacDonald, 1971), pp. 61-62.

11. This interpretation also accords with the separate role that surface area plays as regards vortex motions. In Part III, surface area is responsible for the force exerted on an object while immersed within a circling mass of plenum particles, "because the larger [a body's] surface is, the greater the quantity of matter acting against the surface" (Pr III 121).

12. Descartes' account of "fluid" bodies seems also to confirm these conclusions. In Pr II 58, he remarks that many typical fluid bodies, such as air and water, put up great resistance to the rapid motions of bodies. Thus, in the collision rules, his ideal condition for the absence of plenum effects apparently translates into an appeal for a resistless "perfect fluid." E. J. Aiton, *op. cit.* pp. 39-41, makes a similar observation.

13. Volume and surface area are two distinct quantities that can be easily confused as equivalent: For example, the volume of a sphere equals the cube of the radius times 4/3 π, while its area equals the square of the radius times 4π.

14. D. M. Clarke is a notable exception. (*op. cit.*, pp. 213-21), for he correctly points out both the function of solidity and the elimination of surface area via the idealized conditions. However, Clarke fails to mention the crucial passages in Part III of the *Principles*, especially Pr III 123 (see above). Thus he does not clearly draw together the three bodily properties of volume, quantity of matter, and surface area as utilized by Descartes.

15. For example, see M. Jammer, *Concepts of Mass in Classical and Modern Physics* (Cambridge, Mass.: Harvard University Press, 1961), pp. 60-61; R. J. Blackwell, "Descartes' Concept of Matter", in *The Concept of Matter in Modern Philosophy* (Notre Dame: U. of Notre Dame Press, 1963), p. 69, fn. 18; J. B. Barbour, *Absolute or Relative Motion?*, vol. 1, *The Discovery of Dynamics* (Cambridge: Cambridge University Press, 1989), p. 429; P. Damerow et al., *Exploring the Limits of Preclassical Mechanics* (New York: Springer-Verlag, 1992), p. 76.

16. J. Carriero, "Comments on E. Slowik's 'Perfect Solidity, Quantity of Motion, and the Problem of Matter in Descartes' Universe' (an earlier version of the present paper), which were both delivered at the American Philosophical Association Central Division Meeting, Spring 1995.

17. In general, the erosion and wear of a body's surface, which are rather complex phenomena, will result in a loss of kinetic energy. R. M. Brach, *Mechanical Impact Dynamics: Rigid Body Collisions* (New York: John Wiley & Sons), pp. 119-120.

18. R. Descartes, *The Philosophical Writings of Descartes, vol. 3, The Correspondence,* eds. and trans. J. Cottingham, et al. (Cambridge: Cambridge University Press, 1991), pp. 246-48. This point is raised by P. Damerow, et al., *ibid.*, p. 102.

19. Leibniz was one of the first commentators to draw attention to this problem. See, G. W. Leibniz, "Critical Thoughts on the General Part of the Principles of Descartes," in *Leibniz: Philosophical Papers and Letters* (Dordrecht: D. Reidel, 1969), pp. 403-7. Moreover, a requirement for congruent contact surfaces can be found in work of another Cartesian, William Neile (1637-1670): "The whole square surface of the one [cube] meets in the same instant of time with the whole square surface of the other." See, W. Neile, "Hypothesis of Motion," in *The Correspondence of Henry Oldenburg, Vol. 5,* eds. A. R. Hall and M. B. Hall (Madison: University of Wisconsin Press, 1968), pp. 519-524. This is also noted by P. Damerow, et al., p. 102.

20. See, W. L. Scott, *The Conflict Between Atomism and Conservation Theory 1644-1860* (London: MacDonald, 1970), pp. 14, 23.

21. I would like to thank Calvin Normore, Ron Laymon, Mark Wilson, John Carriero, and an anonymous referee from the *History of Philosophy Quarterly,* for their helpful comments and suggestions on the various drafts of this paper.

[23]

Against Emptiness:

Descartes's Physics and Metaphysics of Plenitude*

Giancarlo Nonnoi†

WHEN IN the first half of the seventeenth century the 'new scientists' turned their hands to a recording and charting of the new map of learning, the theme of the vacuum was without doubt one of the most complex and delicate.[1]

Antiquity had left an original and vast experimental patrimony[2] as well as a wide range of different philosophical positions, among which that of Aristotle stood out, not only in its radical rejection of the vacuum as a logical contradiction, but also because of the variety and solidity of the arguments advanced.[3]

During the Middle Ages in the Latin West, the vacuum was one of the great themes of natural ontology, and it therefore became entwined with theological debates. Almost all scholars accepted the well-known maxim '*natura abhorret vacuum*'.[4] The formula had a double meaning: on the one hand, it sanctioned the non-actuality of a space totally void of matter in *natura naturata*, while on

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* An earlier version of this paper was read at the BSHP Descartes Conference held in Reading on 3–5 September 1991. English translation by David Nilson.

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Received 15 *January* 1993; *in revised form* 23 *April* 1993.

[1] C. de Waard, *L'Expérience barométrique* (Thouars: Imprimerie Nouvelle, 1936) is still the most complete study on the subject.

[2] 'Le livre des appareils pneumatiques et des machines hydrauliques par Philon de Bysancé, par le Baron Carrà de Vaux', *Notices et Extraits de la Bibliothèque Nationale et autres bibliothèques publiés par l'Académie des Inscriptions et Belles-Lettres*, XXXVIII (Paris: Imprimerie National, 1903); see also F. D. Prager (ed.), *Philo of Byzantium. Pneumatica: The First Treatise on Experimental Physics* (Wiesbaden: 1974); *Heronis Alexandrini Spiritualium Liber, a Federici Commandino urbinate, ex Graeco, nuper in Latinum conversum* (Cum privilegio Gregorij XIII Pont. Max., Urbini, MDLXXV).

[3] See esp. *Physics*, IV(D), 6,213a–9,217b. In the Western and Arab worlds, Aristotle's position became predominant after a debate that went on for several centuries. See P. Duhem, *Le Système du Monde*, 10 vols (Paris: Hermann, 1913–1959), I, chaps V–VI.

[4] E. Grant, *Much Ado about Nothing* (Cambridge: Cambridge University Press, 1981), p. 67ff. Theses contrary to this were very few and not perfectly explicit. Renaissance thinkers gradually moved away from this position. See Charles B. Schmitt, 'Experimental Evidence For and Against a Void: The Sixteenth-Century Arguments', *Isis* LVII (1967), 352–366. Now also in Charles B. Schmitt, *Studies in Renaissance Philosophy and Science* (London: Variorum Reprints, 1981), pp. 352–366.

Stud. Hist. Phil. Sci. Vol. 25, No. 1, pp. 81–96, 1994.
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0039–3681/94 $6.00 + 0.00
Pergamon

the other hand it recognized the possibility of creating such a space, should God decide to do so.[5] In the first half of the seventeenth century, and even beyond that time, this was still one of the arguments emphasized by the schools.[6]

At La Flèche, Descartes studied the problem,[7] and he included it in the mental inventory of truths to be methodologically doubted and re-established on a renewed foundation. It is well known that the contiguity of matter is the metaphysical foundation on which Descartes's mechanical system rests. A vacuum, therefore, as the absence of matter, is for this construction a constant threat of destruction. For this reason, many of the pages written by Descartes on cosmology and physics converge upon the vacuum in order to neutralize its destructive force.[8]

These are commonplace in Cartesian historiography. Less often considered are the details of Descartes' thought concerning '*de vacuo*' or 'spiritual' phenomena, as well as his active participation in the period of remarkable experimental activity that reached its peak in the second half of the 1640s.[9]

Before that period, Galileo's publication of *Two New Sciences* (*Discorsi e dimostrazioni matematiche*)[10] in Leyden in 1638, was an important occasion for detailed treatment of the question from the empirical and theoretical standpoints.

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[5] Grant, *Ibid.*, p. 121ff.

[6] *Commentarii COLLEGII CONIMBRICENSIS Societatis Iesu, In Octo Libros Physicorum Aristotelis Stagiritae contextu, latino è regione respondenti aucti, duas in partes ob studiosorum commoditatem sunt divisi* . . . (Lugduni, Sumptibus Ioannis Baptistae Buysson. Superiorum permissu. M.D.XCIII), Secunda Pars, pp. 46f–73f; *D. Francisci Toleti Societatis Iesu Commentaria una cum Questionibus in octo libros Aristotelis De physica auscultatione, nunc secundo in lucem edita* (*Venetiis, apud Iuntas*, 1580; 1st edn, 1573), fol. 123r, col. 2 and *passim*.

[7] (*Oeuvres de Descartes* (hereafter *Oeuvres*), eds Ch. Adams and P. Tannery, 12 vols (Paris: Vrin, 1974–1983; 1st edn 1897–1913), vol. 3, p. 185; E. Garin, *Vita e opere di Cartesio* (Bari: Laterza, 1984; 1st edn, 1967).

[8] At the beginning of his scientific career, Descartes had taken the vacuum into consideration as a purely ideal condition of the motion of bodies, but he soon began to lose interest in this approach. *Oeuvres*, vol. 1, pp. 90–91, pp. 230–231; vol. 10, p. 75, p. 219. See also G. Milhaud, *Descartes savant* (Paris: Alcan, 1921), p. 25ff; A. Koyré, *Études Galiléennes: II La loi de la chute des corps: Descartes et Galilée* (Paris: Hermann, 1939) p. 99ff; G. Crapulli, *Introduzione a Descartes* (Bari: Laterza, 1988), pp. 15–16; W. R. Shea, *The Magic of Numbers and Motion* (Canton, MA: Science History Publications, 1991) pp. 309–311.

[9] Descartes' interest in these experimental events lasted to the end of his days. *Oeuvres*, vol. 5, pp. 447–448. The role that Descartes attributed to experiment in the search for truth has always been one of the themes most discussed by scholars. I shall therefore cite only the most recent work, to my knowledge, on the subject: A. Pala, *Descartes e lo sperimentalismo francese, 1600–1650* (Roma: Editori Riuniti, 1990), esp. p. 123ff.

[10] *Discorsi e Dimostrazioni Matematiche, intorno a due nuove Scienze Attinenti alla Meccanica & i Movimenti Locali, del Signor Galilei Linceo, Filosofo e Matematico primario del Serenissimo Gran Duca di Toscana* . . . (In Leida, Appresso gli Elzevirii. M.D.C.XXXVIII). In *Opere di Galileo Galilei*, 20 vols, ed. A. Favaro (Firenze: Barbera, 1890–1909, reprint 1929–39, 1964–66, 1968), vol. 8, pp. 43–313.

Galileo, in the First Day (*Prima Giornata*) of his last masterpiece, held that nature's abhorrence of the vacuum was at the origin of suction phenomena (pumps, suction cups, bellows, etc.). He explained the strong adherence of two perfectly smooth surfaces in the same way. A swarm of minute and indivisible empty spaces imprisoned within bodies accounted for their coherence.[11] The nucleus of the Galilean theory resided, however, in the idea that the attractive–repulsive resistance (induced by the vacuum) was *limited*, and could be overcome through the application of an adequate force. Referring to a notion that was common among craftsmen, Galileo indicated the limit of suction pumps in raising water (eighteen Tuscan cells) as the resistance 'of the vacuum' or 'to the vacuum'.[12]

Having received a copy of *Two New Sciences*,[13] Descartes offered an extended criticism.[14] The *horror of the vacuum* is one of the points raised in a letter he wrote to Marin Mersenne on 11 October 1638. Descartes's criticism was radical. The fear of the vacuum, he maintained, could not be at the origin of cohesion and suction because, should such a force exist, no other force would be capable of overcoming it.[15] It is clear that Descartes, in the manner of the Scholiasts, assigned an unlimited value to the *horror vacui* and failed to see the epistemological metamorphosis that the aphorism had undergone since Galileo had reduced its significance and dealt with this *horror* as a force rather than as a principle. In any case, it is also evident that with an objection of this kind Descartes intended first and foremost to advance a preliminary question rather than supply a causal explanation. A few lines further on, Descartes indicated what for him was the true cause: 'What he [Galileo] ascribes to the vacuum should be ascribed only to the weight of the air.'[16]

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[11] *Ibid.*, pp. 59–72.

[12] *Ibid.*, p. 64.

[13] In August 1638. See Descartes to Mersenne, 23 August 1638, *Oeuvres*, vol. 2, p. 336.

[14] 'Je trouve en general qu'il quitte le plus qu'il peut les erreurs de l'Eschole, et tasche à examiner les matieres physiques par des raisons mathematiques . . . Il fait continuellement des digressions et ne s'areste point à expliquer tout à fait une matiere . . . il a seulement cherché les raisons de quelques effets particuliers, et ainsy qu'il a basti sans fondement.' Descartes to Mersenne, 11 October 1638, *Oeuvres*, vol. 2, p. 380. See also W. R. Shea, 'Descartes as Critic of Galileo', in R. E. Butts and C. Pitt (eds), *New Perspectives on Galileo* (Dordrecht and Boston: Reidel, 1978), pp. 139–159; R. Lefèvres, 'Descartes contre Galilée', in C. Maccagni (ed.), *Saggi su Galileo Galilei*, 2 vols (Firenze: Barbera, 1972), vol. 1, pp. 297–308, and F. Trevisani, 'Descartes contra Galilei: Inventrix e Experientia', in P. Casini (ed.), *Alle origini della rivoluzione scientifica* (Roma: Istituto dell'Enciclopedia Italiana, 1991), pp. 179–197.

[15] 'Il donne deux causes de ce que les parties d'un cors continu s'entretienent: l'une est la crainte du vuide, l'autre certaine cole ou liaison qui les tient, ce qu'il explique encore apres par le vuide; et ie les croy toutes deux tres fausses . . .; et il est certain que, si c'estoit la crainte du vuide qui empeschast que deux cors ne se separassent, il n'y auroit aucune force qui fust capable de les separer.' *Oeuvres*, vol. 2, p. 382.

[16] 'Ce qu'il attribue au vuide ne se doit attribuer qu'à la pesanteur de l'air.' *Oeuvres*, vol. 2, p. 382. For the English translation see *The Philosophical Writings of Descartes, vol. 3, The Correspondence*, translated by J. Cottingham, R. Stoothoff, D. Murdoch, A. Kenny (Cambridge: Cambridge University Press, 1991), p. 125.

This statement is of great historical interest, but it must be assessed with caution. The weight of air is a key concept in understanding 'spiritual' phenomena, but if it remains isolated and is not related to the concept of atmospheric pressure,[17] it leads to nothing but a rough description of the events involved. Furthermore, the kinetic origin of the Cartesian notion of gravitation[18] imposes such strict limits as to make it problematic, if not impossible, to arrive at a clear perception of what is specific to aerostatics. In short, in Descartes's solution the influence of his metaphysics is plainly visible. Reference to past scientific traditions is no less pronounced than in Galileo's theory.[19]

These factors, taken together, while reducing the historical value and the explicative importance of *la pesanteur de l'air*, at the same time cast light on the reasons that kept Descartes from appreciating the novelty of Galileo's thesis which indicated eighteen Tuscan cells as the *natural limit* beyond which water cannot be raised by a suction pump at ground level. We can understand why Descartes, along with artisans and some authors of the Late Renaissance,[20] attributed this limit to a technical deficiency of the equipment or the nature of water, and why on this point he agreed with Simplicio, the Aristotelian character in Galileo's *Two New Sciences*.[21] This is not to say that Descartes returns to traditional positions. The character in Galileo's last dialogue does not represent a caricature of Aristotelian orthodoxy, or a facile *contracanto*. The role of Simplicio is to evaluate critically empirical and theoretical propositions in the light of logical protocols of reason, protocols Descartes was inclined to accept.

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[17] Descartes to Mersenne, 30 August 1640: 'la colonne d'air . . . iusques au ciel, n'y pese point . . . Car . . . il n'y a rien qui pese, que ce qui peut descendre, lors que le corps sur lequel il pese est osté', *Oeuvres*, vol. 3, p. 165. 'In vase, quantumvis profundo et lato, inferiores aquae alteriusve liquoris guttae, a superioribus non premantur; nec etiam premantur singulae partes fundi, nisi a totidiem guttis, quot ipsis perpendiculariter incumbunt.' *Principia philosophiae*, IV, art. 26, in *ibid*., vol. 8-1, p. 215. See also *Le Monde*, *ibid*., vol. 11, p. 77.

[18] *Le Monde*, in *Oeuvres*, vol. 11, pp. 72–80; *Principia*, IV, 23, in *ibid*., vol. 8-1, pp. 213–214. See also A. Pessel, *Mersenne, la pesanteur et Descartes*, in N. Grimaldi and J.-L. Marion (eds), *Le Discours et sa Méthode* (Paris: P.U.F., 1987), pp. 163–185.

[19] An interesting example regarding this: 'Esse autem hoc intrinsecum cuiusque corporis spatium negari non potest, ut videtur, quia invicem sese mutua consequentia inferant. Nam si corpus est, spatium est; et si verum spatium est, in eo corpus est.' *D. Francisci Toleti Societatis Iesu Commentaria una cum Questionibus in octo libros Aristotelis De physica auscultatione, nunc secundo in lucem edita* (*Venetiis, apud Iuntas*, 1580), fol. 123r, col. 2.

[20] George Agricola, *De re metallica* (Basileae: 1556), pp. 140–141; Jacques Besson, *Theatrum instrumentorum et machinarum* (Lugduni: 1578), p. XLVIII; Agostino Ramelli, *Le diverse et artificiose machine* (Parigi: 1588), pp. 7–36; Salomon De Caus, *Les raisons des forces mouventes* (Francofort: 1615), L.I., Probl. I–VI, XIII, XV–XIX.

[21] 'La façon qu'il donne pour distinguer les effets de ces deux causes ne vaut rien, et ce qu'il fait dire a Simplicio est plus vray, et l'observation que les pompes ne tirent point l'eau a plus de 18 brasses de hauteur ne se doit point rapporter au vuide, mais ou a la matiere des pompes ou a celle de l'eau mesme, qui s'escoule entre la pompe et le tuyau, plutost que s'eslever plus haut.' *Oeuvres*, vol. 2, p. 382.

This outlook explains, on the other hand, why Descartes, who judged the *horror vacui* to be a chimera, an occult or anthropomorphic quality,[22] did not reject it with derision, but turned it against its champion. His purpose was first and foremost to confute the thesis in favour of the vacuum, which was at the base of the attraction–repulsion mechanism. For Galileo, the natural repulsion of the vacuum did not act as a preternatural preventive force, as it had for medieval thinkers, but was one of the fully-fledged *forces of nature* that come into play in the presence of an effective vacuum, or at just the instant at which it begins to form. On this subject, Galileo's text left no room for doubt. The experiment with the adherence of two plates, often invoked as an argument against the vacuum, seemed, unless one admitted the far more paradoxical thesis of instantaneous motion, to require its presence. 'At least for a very brief time . . . we must say that by force (or contrary to nature) a void is sometimes to be admitted.'[23]

It is easy to understand that Galileo's position, although cautious, went far beyond what was allowed by the Cartesian idea of corporeal substance[24] and the entire philosophy that lay behind it.[25]

That the vacuum, and not the weight of the air, was foremost in Descartes's thoughts is confirmed by another letter written to Father Mersenne, and dated 15 November 1638. In a previous letter Mersenne had pointed out that the weight of the air, having a finite value, could guarantee against the vacuum only to a limited extent. Descartes evidently judged this observation relevant, since he did not deny it, but he re-evaluated the incidence of the weight of the air on the phenomena of the cohesion of bodies, and brought to the forefront the fundamental reason for his opposition to the vacuum: 'I think just as impossible that a space should be empty as that a mountain should be without a valley.'[26]

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[22] *Le Monde*, in *ibid.*, vol. 9, p. 20.

[23] 'Se ben per breve momento di tempo . . . converrà dire che, pur per violenza o contro a natura, il vacuo talor si conceda'; *Discorsi* . . . in *Opere di Galileo, op. cit.*, note 10, vol. 8, p. 59, p. 60. For the English translation see Galileo Galilei, *Two New Sciences*, translated with introduction and notes by Stillman Drake (Madison: The University of Wisconsin Press, 1974), pp. 20–21.

In the French paraphrase of Galileo's book, edited by Mersenne, *Les Nouvelles Pensées de Galilée, Mathematicien et Ingenieur du Duc de Florence. Où par des Inventions merveilleuses et des Demostrations inconnuēs iusques à present, il est traitté de la proportion des Mouvemens, tant naturels que violens, et de tout ce qu'il a de plus subtil dans les Mechaniques et dans la Physique. Traduit d'Italien en François* (A Paris, chez Pierre Ricolet, MDCXXXIX), the problem was summarized in the following way: 'Et parce les dites pierres se peuvent séparer par forze, il s'ensuit que le vuide demeure quelque temps sans estre remply' (pp. 9–10).

[24] On the essential identity of space and matter, see: R. J. Blackwell, *Descartes' Concept of Matter*, in E. McMullin (ed.), *The Concept of Matter in Modern Philosophy* (Notre Dame and London: University of Notre Dame Press, 1978), pp. 59–75; and M. Mamiani, *Teorie dello spazio da Descartes a Newton* (Milano: F. Angeli, 1979), pp. 15–56.

[25] According to Fernand Alquié's well-known thesis, metaphysics, discovered by Descartes in 1630, took over from science beginning in 1637, while it was elaborated and assumed its final form between 1638 and 1640. See *La dècouverte métaphysique de l'homme chez Descartes* (Paris: P.U.F., 1950), p. 96, p. 111; *Descartes, Oeuvres philosophiques*, textes établis, présentés et annotés par A. Alquié (Paris: Garnier, 1967), vol. 2, p. 1, p. 7.

Galileo's writings had challenged Mersenne's weak faith in plenitude and had reawakened his experimental interest in the weight of air.[27] But it was the experiment with the adherence and separation of smooth plates that raised the greatest doubts and which was immediately passed along to Descartes. The dilemma was clear: either admit, as Galileo had, the creation of a vacuum, albeit for the shortest fraction of time, or give up the postulate, no less fundamental, according to which motion takes place in time. On the physical plane, the weight of air is not capable of overcoming the dilemma; it is necessary to invoke an *ad hoc* complementary hypothesis. And this is what Descartes did: 'Pource que l'air ne peut entrer en un instant en l'espace qu'elles [the two plates] laissent entre elles, il en est necessairement vuide en cet instant là, et seulement rempli de matiere subtile.'[28]

The *subtle matter*, or *aether*[29] enters and occupies all the spaces which, for whatever reason, have become free of bodies. The *matière subtile* is, however, to all intents a mechanical agent, a body. Therefore, the deductions that may be made are exposed not only to the vagaries of the experiment, but also to all the risks connected with verification and empirical falsification. Cartesian fullness is, on the contrary, a metaphysical postulate of a higher order and cannot be guaranteed by a mechanical agent. It also evades our senses. Experiment may offer arguments in favour, but these will never replace the clarity and distinction of principles.[30] This is the reason why in a passage of Descartes's letter to Mersenne following the one just quoted, the question is discussed on the general plane of corporeal being, the only way that was conclusive for Descartes.

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[26] The complete text is as follows: 'La seconde partie contient vos remarques touchant Galilée, ou j'avoüe que ce qui empesche la separation des cors terrestres contigus, est la pesenteur du cylindre d'air qui est sur eux, iusques à l'atmosphere, lequel cylindre peut bien peser moins de cent livres. Mais je n'avouë pas que le force de la continuité des cors vienne de là; car elle ne consiste qu'en la liaison ou en l'union de leur parties. J'ay dit que, si quelque chose se faisoit crainte du vuide, il n'y auroit point de force qui fust capable de l'empescher; dont la raison est que je croy qu'il n'est pas moins impossible qu'un espace soit vide, qu'il est qu'une montagne soit sans valée.' *Oeuvres*, vol. 2, pp. 439–440. For the English translation see *The Philosophical Writings of Descartes, The Correspondence*, *op. cit.*, note 16, vol. 3, p. 129.

The image of the mountain and valley is to be found several times in Descartes's works, above all when he wishes to refer to a conceptual distinction between elements which are indivisible on the factual plane. In the *Meditationes* (V) the simile illustrates, for example, the impossibility of perceiving divine essense and existence separately. *Oeuvres*, vol. 7, pp. 66–67.

[27] Mersenne had begun to work on the question of the weight of air following the publication of the *Essays de IEAN REY docteur en medecine. Sur la recerche de la cause pour laquelle l'Etain et le Plomb augmentent de poids quand on les calcine* (A Bazas. Par Giullaume Millanges, imprimeur ordinaire du Roy, 1630). On the subject see P. Duhem, 'Le P. Marin Mersenne et la pesenteur de l'Air', *Revue Générale des Sciences*, 15–30 Septembre 1906, pp. 769–782, pp. 809–817. Tiré à part, Paris, 1906, 79 pp.; R. Lenoble, *Mersenne ou la naissance du mécanisme* (Paris: Vrin, 1971; 1st edn, 1943), p. 428.

[28] Descartes to Mersenne, 9 January 1639, *Oeuvres*, vol. 2, p. 481.

[29] On the many functions of this *a priori* element of Descartes' world system, see *Le monde*, in *Oeuvres*, vol. 11, pp. 24–26, pp. 95–97; and *Principia*, III, art. 49, 51, 52, in *Oeuvres* vol. 8-1, pp. 104–105. For a historical evaluation of Descartes' position, see M. Boas Hall, '*Matter in Seventeenth Century Science*', in McMullin (ed.), *The Concept of Matter in Modern Philosophy*, *op. cit.*, note 24, pp. 76–99.

This question had been discussed during the Middle Ages and was remembered by Mersenne, who asked: Can God completely empty a room of air and leave nothing there to take its place? Descartes replied that we must say that the walls of such a room would come together, otherwise there would be a contradiction in our thought. It would be tantamount to thinking of levelling all the mountains on Earth while keeping all the valleys, or like thinking that we could eliminate all bodies leaving only space. Our idea of body or matter in general, Descartes continued, is included in the idea we have of space, that is, of something long, wide and deep, just as the idea of mountain is included in that of valley.[31]

In a letter dated 2 June 1631, probably addressed to Reneri, Descartes had already referred to aether, not only as a body impregnating space, but also as a mechanical concourse of pneumatic phenomena. This letter is of great interest since it contains Descartes's principal physico-mechanical views about phenomena usually connected with the vacuum. He did not limit himself to an enunciation of the function he attributed to aether and air pressure, but connected the two factors in the theory of circulating matter of Platonic memory (*ἀντιπερίστασις*). It was once again a quite simple experiment that raised doubts: why is it that the mercury contained in a glass tube closed at one end does not immediately spill out when the tube is turned upside down? The idea behind Descartes's answer is that of an integrated mechanical system in which the movement of each part, in a circular succession starting from the adjoining ones, implies the movement of the other parts. His reasoning can be summarized as follows: air has weight and the upper layers of the atmosphere press on the lower ones; the spaces between the air particles are full of aether which, by moving with a rapid and swirling motion, partly counterbalances this pressure, which otherwise would be enormous at ground level. These reciprocal actions not only keep the mercury from spilling out of the receptacle, but make its coming out possible on the one hand only when the particles (and then the contiguous ones) obstructing the opening of the tube begin to move, and on the other hand when another material, aether or air, takes the place of the mercury at the top of the tube, following a circular chain of movements which reaches up to the sky.[32] Space does not allow a detailed discussion of the content of this letter in which some have seen an inkling or anticipation of the barometric explanation.[33] I shall limit myself to a few observations.

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[30] Descartes 'was not a rigid deductivist; but it is equally clear that he was not a sophisticated experimentalist'. J. Cottingham, *Descartes* (Oxford: Blackwell, 1986), p. 94.

[31] 'Si vous voulez concevoir que Dieu oste tout l'air qui est dans une chambre, sans remettre aucune autre cors en sa place, il faut par mesme moyen que vous conceviez que les murailles de cete chambe se vienent joindre, ou bien il y aura de la contradiction en vostre pensée. Car tout de mesme qu'on ne sçauroit imaginer qu'il applanisse toutes les mountaignes de la Terre, et que, nonobstant cela, il y laisse toutes les valées, ainsy ne peut-on penser qu'il oste toute sorte de cors, et que, nonobstant, il laisse de l'espace, à cause que l'idée que nous avons du cors, ou de la matiere en general, est comprise en celle que nous avons de l'espace, à sçavoir que c'est una chose qui est, longue large et profonde, ainsy que l'idée d'une montaigne est comprise en celle d'une valée.' *Oeuvres*, vol. 2, pp. 481–482.

First and foremost, it must be pointed out that the presence of aether, this indispensable agent in the world machine, makes it difficult to evaluate the Cartesian explanation from a positivistic viewpoint. It has already been observed that recourse to this element introduces several inconsistencies, and that the pressure of the air, when all is said and done, has little explanatory value.[34] On the other hand, the difficulties connecting this with other Cartesian writings on the same subject make it reasonable to hold that the notion of air pressure is proposed without a full exploration of how it relates to the principles of his general physics. From the historical standpoint, it must be said that the notions of weight, pressure, and elasticity of air and their correlatives are not original Cartesian ideas, but come from the hydrostatic tradition of the Netherlands, begun by Stevin[35] and developed by Beeckman[36] with excellent results. More genuinely Cartesian is the idea of aether, both in reference to its capacity to pervade space and in connection with the elasticity of air.[37] These considerations allow a better understanding of Descartes' judgement on Galileo's *limited force of the vacuum*. It appears as the product of a complex balance between, on the one hand, the recognition of the mechanical action of some natural bodies (air), and, on the other hand, an instance of reason with its ironclad *a priori* laws. In other words, the Cartesian position expresses the need for a synthesis between positions originating from Stevin and Beeckman[38] and the rejection of the vacuum's ontological nature. By its very nature, this refusal clouded his mind to the normative value of certain empirical results pointed out by Galileo.

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[32] 'Imaginez l'air come de la laine, & l'aether qui est dans ses pores comme des tourbillons de vent, qui se meuvent ça et là dans cette laine; & pensez que ce vent qui se joüe de tous costez entre les petit fils de cette laine, empesche qu'ils ne se pressent si fort l'un contre l'autre, come ils pourroient faire sans cela. Car ils sont tous pesans, & se pressent les uns les autres autant que l'agitation de ce vent leur peut permettre, si bien que la laine qui est contre la terre est pressée de toute celle qui est au dessus iusque au delà des nuës, ce qui fait une grande pesanteur; en sorte que s'il falloit élever la partie de cette laine, qui est, par exemple, à l'endroit marqué O, avec toute celle qui est du dessus en la ligne OPQ, il faudroit une force tres-considerable. Or cette pesenteur ne se sent pas communément dans l'air, lors qu'on le pousse vers le haut; pour ce que si nous en élevons une partie, par exemple celle qui est au point E, vers F, celle qui est en F va circulairement vers GHI & retourne en E; & ainsi sa pesanteur ne se sent point, non plus que seroit celle d'une roüe, si on la faisoit tourner, & qu'elle fut parfaitement en balance sur son aissieu. Mais dans l'exemple que vous supposez du tuyau DR, fermé par le bout D par où est attaché au plancher AB, le vifargent que vous supposez estre dedans, ne peut commencer à descendre tout à la fois, que la laine qui est vers R n'aille vers O, & celle qui est vers O n'aille vers P & vers Q, & ainsi qu'il n'enleve toute cette laine qui est en laligne OPQ, laquelle prise toute ensemble est fort pesante. Car le tuyau estant fermé par le aut, il n'y peut entrer de laine, ie veux dire d'air, en la place du vif-argent, lorsqu'il descend. Vous direz qu'il peut bien entrer du vent, ie veux dire de l'aether, par les pores du tuyau. Ie l'avoüe; mais considerez que l'aether qui y entrera ne peut venir d'allieurs que du ciel; car encore qu'il y en ait par tout dans les pores de l'air, il n'y en a pas toutefois plus qu'il en faut pour les remplir; et par consequent s'il y a une nouvelle place à remplir dans le tuyau, il faudra qu'il y vienne de l'aether qui est au dessus de l'air dans le ciel, & partant que l'air se hausse en sa place.

'Et afin que vous ne vous trompiez pas, il ne faut pas croire que ce vif-argent ne puisse estre separé du plancher par aucune force, mais seulement qu'il y faut autant de force qu'il en est besoin pour enlever tout l'air qui est depuis là iusqu'au dessus des nuës'. *Oeuvres*, vol. 1, pp. 205–207.

[33] Among others P. Duhem, *Le P. Marin Mersenne et la pesenteur de l'Air* (tirage à part), p. 17.

[34] Milhaud, *op. cit.*, note 8, pp. 208–210.

That the connection between the principles of the world's mechanical system and this rough draft of a baroscopic hypothesis was uncertain and poorly consolidated is proved by the works Descartes planned and prepared for publication. He was very careful about the coherence and compactness of his arguments, and he rarely indulged in hypotheses inconsistent with the more general principles of his philosophy of nature. In the texts written for the public, the embryonic hypothesis of air pressure is in fact put aside in favour of the hypothesis of the universal circulation of matter. This is certainly more functional within the general architecture of the mechanical universe and more in line with the notion of *res extensa* as the organic identity of space and matter.

In *Le Monde*, written between 1629 and 1633, in the chapter entitled 'The Void', speculating on why the wine in a cask does not flow out of a tap at the bottom unless the bung at the top is removed, Descartes made no reference to atmospheric pressure; and yet this phenomenon is analogous to the one discussed in the letter of 2 June 1631. Significantly, this perfectly ordinary experience was presented in *Le Monde* as evidence that the universe's movements can only be circular.[39] But far more worthy of note is what Descartes added:

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[35] *Hypomnemata Mathematica . . . A SIMONE STEVENO conscripta, et a Belgico in Latinum à VV.IL.SN. conversa* (Lugduni Batavorum, ex Officiis Ioannis Patii Academiae Typographu, Anno 1608); see esp. *De Statica, liber IV, De Hydrostatices Elementis*. The first vulgate edition was published in 1586 at Leyden.

[36] *Journal tenu par Isaac Beeckman de 1604 à 1634*, introduction and notes by C.de Waard, 4 vols (La Haye: M. Nijhoff, 1939–45), vol. 1, p. 23, p. 26, p. 36, p. 78, p. 79; and *Oeuvres*, vol. 10, pp. 67–74, p. 228.

[37] In Beeckman's *Journal* this idea clearly began appearing regularly starting from the beginning of his friendship with Descartes (November 1618).

[38] Milhaud, *op. cit.*, note 8, pp. 34–35.

> For all that I do not wish to insist that there is no vacuum at all in nature ... the observations of which I have spoken are not sufficient to prove my point, although they are enough to confirm that the spaces in which we perceive nothing by our senses are filled with the same matter as those occupied by the bodies that we do perceive, and contain at least as much of this matter as the latter spaces.[40]

Whether the vacuum exists or not is thus not a question of physics, or at least not of physics alone. In the first instance it has to do with the world of substance and its ontology. This is why the knot can be undone only in the *Principia*, and within the ambit of the *Principles of Material Things*. In this world of ours it is possible to give only examples having analogical value gained from common and familiar experiences.

But with the passing of time, even in Descartes's private papers, the theme shifted from the empirical, physical plane to a more strictly philosophical one, with the progessive emergence of a solution of the antiperistatic kind. This, for example, was the scheme followed in explaining how water is raised by suction pumps: 'L'eau des pompes', he wrote to Mersenne, 'monte avec le piston qu'on tire en haut, a cause que, n'y ayant point de vuide en la nature, il ne se peut faire aucun mouvement, qu'il n'y ait tout un cercle de cors qui se meuve en mesme tems.'[41]

As the years went by, *l'esprit de système*, which had been present from Descartes' intellectual beginnings, tended to move to the foreground and colour his overall explanations of phenomena.[42] With this slow but evident change in outlook, the ontological impossibility of the vacuum and the resultant circulation of matter gained the upper hand once and for all in the explanation of pneumatic phenomena, and replaced efficient mechanical causes, like the weight of air invoked in the letter to Reneri in June 1631. In 1643, for example, at the height of the dispute and theological polemics raised by the *Meditations*, Descartes still found time to return to these arguments.[43] It was once again the indefatigable Mersenne, engaged in experimental research,[44] who solicited his judgement on the functioning of bellows and the inverted U siphon—two devices characteristic of the literature on pneumatics.[45] By then, Descartes saw the understanding of the smallest phenomena of motion (of which pneumatic ones are but one kind) as requiring the involvement of the entire universal movement:

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[39] 'Lors que le vin qui est dans un tonneau, ne coule point par l'ouverture qui est au bas, a cause que le dessus est tout fermé, c'est parler improprement que de dire, ainsi que l'on fait d'ordinaire, que cela ce fait, crainte du vuide. On sçait bien que ce vin n'a point d'esprit pour craindre quelque chose; & quand il en auroit, je ne sçai pour quelle occasion il pourroit apprenhender ce vuide, qui n'est en effect qu'une chimere. Mais il faut dire plütost, qu'il ne peut sortir de cet tonneau, a cause que dehors tout est aussi plein qu'il peut estre, et que la partie de l'air dont il occuperoit la place s'il descendoit, n'en peut trouver d'autre où se mettre en tout le reste de l'Univers, si on ne fait une ouverture au dessus du tonneau, par laquelle cét air puisse remonter circulairement en sa place.' *Oeuvres*, vol. II, p. 20.

[40] 'Je ne veux pas assurer our cela qu'il ny a point du tout de vuide en la Nature ... les experiences dont j'ay parlé, ne sont point suffisantes pour le prouver, quoy qu'elles le soient assez, pour persuader que les espaces où nous ne senton rien, sont remplis de la mesme matiere, & contiennent autant pour le moins de cette matiere, que ceux qui sont occupez par les corps que nous sentons.' *Oeuvres*, vol. II, pp. 20–21. For the English translation see *The Philosophical Writings of Descartes*, vol. 1, translated by J. Cottingham, R. Stootoff, D. Murdoch (Cambridge: Cambridge University Press, 1991), p. 87.

[41] Letter to Mersenne, 16 October 1639, *Oeuvres*, vol. 2, pp. 588–589.

[42] In the wealth of literature on the intertwining between metaphysics and science of nature in Descartes, a useful reference may be the volume P. Gostabel, *Démarches originales de Descartes savant*, (Paris: Vrin, 1982), esp. pp. 181–190.

> N'y ayant point de vuide tous les movemens sont circulaires, c'est à dire, que si un cors se meut, il entre en la place d'un autre, et celuy-cy en la place d'un autre, et ainsy de suite; en sorte que le dernier entre en la place du premier, et qu'il y a un cercle de cors qui se meut en mesme tems.[46]

We are dealing here with expressions which over the years have become almost stereotyped and are used to reiterate concepts which have become consolidated. It can be observed, however, that in these very sentences there is also an echo of Late Medieval naturalistic and conceptual models, since at that time it was supposed that nature in its entirety would be put in motion, up to the point of contradicting its own laws, in order to hinder the formation of a vacuum.[47] Descartes must have heard these philosophical voices. Although the order of his thoughts moved along the lines of a mechanical explanation in the strictest sense, *in itinere* this order deviates in the direction of a philosophical explanation of the *mechanistic* type, the primary role of which is to reinforce the protective shield around extended substance, defined as the identity of space and matter. From the physico-mechanical standpoint, collisions and transfer of matter are an efficient cause sufficient to guarantee the non-actuality of the vacuum, but with respect to the logical and ontological viewpoint, these causes lack those requisites which only the *bona mens seu recta ratio* is capable of appreciating, and upon which Descartes's *Le Monde* is based. The *Principia* are in this respect conclusive. Once the logical analysis of the concept of vacuum has been carried out, there is no longer any need of the weight of air, or even of the universal circulation of matter; substance, by definition, is autonomous. Analysis prevails over synthesis.

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[43] Descartes to Mersenne, 2 and 23 February 1643, *Oeuvres*, vol. 3, p. 613, pp. 632–633.

[44] Lenoble, *op. cit.*, note 27, p. 430.

[45] On the theory of siphons, see G. Nonnoi, *Il pelago d'aria* (Roma: Bulzoni, 1988).

[46] Descartes to Mersenne, 23 February 1643, *Oeuvres*, p. 632.

[47] Roger Bacon was the main theoretician. See P. Duhem, 'Roger Bacon et l'horreur du vide', in A. G. Little (ed.), *Roger Bacon, Essays Contributed by Various Writers on the Occasion of the Commemoration of his Birth* (Oxford: Clarendon Press, 1914), pp. 241–284; and Grant, *op. cit.*, note 4, pp. 69–70.

> The impossibility of a vacuum in the philosophical sense of that in which there is no substance whatsoever, is clear from the fact that there is no difference between the extension of the space, or internal place, and the extension of a body. For a body's being extended in length, breadth, and depth in itself warrants the conclusion that it is a substance, since it is a complete contradiction that a particular extension should belong to nothing; and the same conclusion must be drawn with respect to a space that is supposed to be a vacuum, namely that since there is extension in it, there must necessarily be substance in it as well.[48]

The consolidation of the metaphysical argument did not, however, lead Descartes to abandon all interest in experiment. On the contrary, when Mersenne returned from a long journey through Italy and attempted to repeat Torricelli's famous experiment,[49] Descartes was among the protagonists of the renewed debate.[50] During his second trip to France, between June and October 1647, *le vuide* was one of the hot topics. In Paris, he went to visit the ailing Blaise Pascal, and discussed the new experiments with him and other amateurs.[51] On this occasion he appears to have suggested carrying out Torricelli's experiment on a high mountain.[52] The events of the great period of experiment in France continued to interest him after his return to Egmond, in Holland, where he continued his own observations and experiments. The philosophical frame within which his research took place did not change.[53] The diminishing importance of the weight of air was final. His attention was now pointed in the direction of aether, as a body occupying the spaces left by the mercury. In any case, his experimental interest appears to have been concentrated above all on changes in the level of the mercury column as a consequence of changes in the weather.[54] In short, when many of his fellow countrymen were becoming '*protecteurs*', or '*chercheurs du vuide*',[55] Descartes was more adamant than ever against the vacuum. He was considered by the intellectual community as one of the most authoritative and coherent supporters of the philosophy of plenitude.[56]

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[48] 'Vacuum autem philosophico more sumptum, hoc est, in quo nulla plane sit substantia, dari non posse manifestum est, ex eo quod extensio spatii, vel loci interni, non differat ab extensione corporis. Nam cum ex hoc solo quod corpus sit extensum in longum, latum & profundum, recte concludamus illud esse substantiam, quia omnino repugnat ut nihili sit alia extensio, idem etiam de spatio, quod vacuum supponitur, est concludendum: quod nempe, cum in eo sit extensio, necessario etiam in ipso sit substantia.' *Principia*, II, art. 16, in *Oeuvres*, vol. 8-1, p. 49. For the English translation see *The Philosophical Writings of Descartes*, vol. 1, pp. 229–230.

The impossibility of the vacuum may run counter to common sense and everyday experience: 'places that are apparently empty are ontologically (i.e., really) full' (Shea, *op. cit.*, note 8, p. 251).

[49] Starting from July of 1645. See R. Taton, 'L'annonce de l'expérience barométrique en France', *Revue d'Histoire des Sciences* 16 (1963), 77–79; *Observazion touchant le vuide, faite pour la premiere fois en France contenuē en une lettre écrite à Monsieur Chanut, Resident pour sa Majesté en Suede. Par Monsieur Petit Intendant des fortifications, le 19 novembre 1646. avec le Discours qui a esté imprimé en Pologne sur le mesme sujet en jullet 1647* (A Paris, chez Sebastien Cramoisy et Gabriel Cramoisy. M.DC.XLVII), p. 3.

[50] *Oeuvres*, vol. 12 (*Supplement*), *Vie et oeuvres de Descartes*, by Ch. Adam, pp. 451–457. In the opinion of D. Garber, *Descartes' Methaphysical Physics* (Chicago and London: The University of Chicago Press, 1992), p. 117, p. 119, p. 136, Descartes' anti-atomistic program here reaches one of its highest moments.

[51] On 23 and 24 September. See Jacqueline Pascal to Gilberte Périer, 25 September 1647, *Correspondance du P. Marin Mersenne Religieux Minime*, eds C.De Waard and A. Beaulieu (Paris: Edition du CNRS, 1983), vol. 15, pp. 446–447.

[52] Descartes to Mersenne, 13 December 1647, and to Pierre de Carcavi, 11 June 1649, *Oeuvres*, vol. 5, p. 99, p. 366. The dispute between Pascalians and Cartesians, both of yesterday and today, as to whom credit for this idea should be attributed, has been heated, to say the least. A balanced review, edited by Leon Brunschvicg is contained in the *Oeuvres de Blaise Pascal*, eds L. Brunschvicg, P. Boutroux and F. Gazier, 14 vols (Paris: Hachette, 1908–1914), vol. 1, pp. XXII–XLIV.

[53] 'Toutes vos experiences du vifargent ne m'estonnent point, & il n'y en a point que ie n'accorde fort facilement avec mes principes'. Descartes to Mersenne, 4 April 1648, *Oeuvres*, vol. 5, p. 141.

With the death of Father Mersenne at the beginning of September 1648, Descartes' connections with the *France savante* became more tenuous, and the bond which allowed him to keep abreast of the experimental activity of the Pascalian circle was severed. On 11 June 1649 he still did not known the result of the *grande expérience de l'equilibre des liqueurs*, which apparently he had been the first to conceive,[57] and which Florin Périer had carried out, following Pascal's instructions, on Puy-de-Dôme on 9 September of the previous year.[58] Not even this '*experimentum crucis*' was capable of modifying Descartes's view: he considered it a confirmation of his principles and his conjecture that subtle matter was in perennial circulation.[59] In reality, while in France the baroscopic revolution was in full and noisy swing, Descartes had drawn up the last will and testament of his philosophy of plenitude, expressing his thought in a paper, to which the Latin prose lends a solemn note, which he sent to the Jansenist Antoine Arnauld on 29 July 1648.

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[54] *Oeuvres*, vol. 5, pp. 99–100, p. 115, p. 119, pp. 141–142. R. Dugas, *La mécanique au XVIIéme siécle*, English translation *Mechanics in the Seventeenth Century* (Neuchâtel and New York: Edition du Griffon, 1958), p. 227, with great perspicacity connected Descartes's barometric observations with his battle against the vacuum. Important considerations on Descartes's position have been published by P. Mouy, *Le Développement de la Physique Cartésienne* (Paris: Vrin, 1934), pp. 35–45.

[55] *Oeuvres*, vol. 5, p. 116. The reference, although not explicit, is to Blaise Pascal, who in October of 1647 had published *Experience nouvelles touchant le vuide, faites dans des tuyaux, syringues, soufflets et siphons de plusieurs longheurs et figures; vec diverses liquers comme vif-argent, eau, vin, huile, air, etc. Avec un discours sur le mesme sujet ou est monstré qu'un vaisseau si grand qu'on le pourra faire peut estre rendu vuide de toutes les matieres connues en la nature et qui tombent sous les sens et quelle force est necessaire pour faire admettre ce vuide. Dedié à Monsieur Pascal, Conseiller du Roy en ses Conseil d'estat et privé. Par le sieur B.P. son fils. Le tout en abbrégé et donné par advance d'un plus grand traité sur le mesme sujet* (A Paris chez Pierre Margat, au quai de Gesvres, à l'Oiseau de Paradis, MDCXLVII. Avec permission).

[56] An eloquent testimonial to this is the self-assurance with which the Jesuit Etienne Noël made use of the Cartesian concepts of matter, body and aether, mixed with enunciations of marked peripatetic origin in his attack on the theses in favour of the vacuum of Pascal and his circle. See Première & Seconde Lettre du P. Noël à Pascal, B. Pascal, *Oeuvres complètes*, ed. Jacques Chevalier (Paris: Gallimard, 1954), pp. 1438–1452; *Le Plein du Vuide, ou Le corps, dont le Vuide apparent des experiences nouvelles, est rempli. Trouvé par d'autres experiences, confirmé par les mesmes, & demonstré par raison Physiques. Par P.ESTIENNE NOEL, de la Compagnie de Iesus. A PARIS* (Chez Iean du Bray, ruë sainct Iacques aux Espics meurs. M.DC.XLVIII. Avec permission).

[57] Descartes to Carcavi, *Oeuvres*, vol. 5, p. 366. Carcavi's replay is dated 9 July 1649, *ibid.*, p. 370.

[58] *Recit de la grande experience de l'equilibre des liqueurs, pojectée par le sieur B.P. pour l'accomplissement du traicté qu'il a promis dans son Abbregé touchant le vuide, et faite par le sieur F.P. en une des plus hautes montagnes d'Auvergne* (Paris, 1648), in Pascal, *Oeuvres complètes, op. cit.*, note 56, pp. 392–401.

[59] Descartes to Carcavi, 17 August 1649, *Oeuvres*, vol. 5, p. 391.

> The difficulty in recognizing the impossibility of the vacuum seem to arise primarily because we do not sufficiently consider that nothing can have no properties; otherwise, seeing that there is true extension in the space we call empty, and consequently all the properties necessary for the nature of body, we would not say that it was wholly empty, that is, mere nothingness.[60]

These arguments and concepts in this and in other forms recur in Descartes's writings. Less frequently, he addressed the question of the *vacuo* in theological terms.[61] Arnauld had questioned him insistently on the possibility that the vacuum might be produced by God.[62] As can easily be understood, the subject was delicate. The Jesuit theologians, among whom was Etienne Noël (Descartes's former teacher at La Flèche), warned that the discussion of the vacuum came dangerously close to dogmatic matters, such as miracles and Eucharist.[63] And perhaps this explains a certain hesitation on Descartes's part.[64]

> I do not think that we should ever say of anything that it cannot be brought about by God. For since every basis of truth and goodness depends on his omnipotence, I would not dare to say that God cannot make a mountain without a valley, or bring it about that 1 and 2 are not 3. I merely say that he has given me such a mind that I cannot conceive a mountain without a valley, or a sum of 1 and 2 that is not 3; such things involve a contradiction in my conception. I think the same should be said of a space which is wholly empty, or of an extended piece of nothing ... and no barrel

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[60] 'Difficultas in agnoscendâ impossibilitate vacui oriri videtur, imprimis ex eo quod non satis consideremus nihili nullas proprietates esse posse; alioquin enim, videntes in eo spatio, quod vacuum vocamus, veram esse extensionem, & ex consequent omnes proprietates quae ad corporis naturam requiruntur, non diceremus illud esse plane vacuum, hoc est merum nihil'. *Oeuvres*, vol. 5, p. 223. For the English translation see *The Philosophical Writings of Descartes, The Correspondence, op. cit.*, note 16, vol. 3, p. 358.

[61] The question had been barely touched upon in a letter to Mersenne dated 9 January 1639 (see note 28), and, without taking many theological precautions, in the *Principia*, II, art. 18, in *Oeuvres*, vol. 8-1, p. 50.

[62] *Oeuvres*, vol. 5, pp. 190–191, p. 215.

[63] See Seconde Lettre du P. Noël à Pascal, B. Pascal, *Oeuvres complétes, op. cit.*, note 56, p. 1444; *Le Plein du Vuide, ou Le corps ... Par P.ESTIENNE NOEL, de la Compagnie de Iesus, op. cit.*, note 56 p. 4; *Demonstratio Ocularis. Loci sine locato: Corporis successivè moti in vacuo: Luninis nulli corpori inhaerentis. A VALERIANO MAGNO FRATE CAPUCCINO, exhibita.* ... (Varsaviae. In Officina Petri Elert S.R.M. Typographi. Approbatio Varsaviae die 16. Iulij, 1647), pp. 50–52, pp. 67–68; *Vacuum Proscriptum. Disputatio Physica Autore PAULO CASATO Placentino Societatis Iesu: In qua Nullius Esse in Rerum Natura Vacuum ostenditur; & potissimum examinatur, An ab argento vivo descendente in fistula superne clausa Vacuum relinquatur, Huiusque experimenti Symptomata explicatur* (Genuae, Imprimi curabat Ioannes Dominicus Peri. M.DC.XLIX. Superiorum permissu), pp. 5–6.

[64] See Descartes to Mersenne, 15 April 1630; *Oeuvres.*, vol. 1, pp. 145–146.

> can be conceived to be so empty as to have inside it no extension, and therefore no body; for wherever extension is, there, of necessity, is body also.[65]

Not far from the end of a career dedicated to his principles, Descartes thus expressed with the utmost clarity how firm his philosophy of plenitude was. The theological questions raised by his position underscore the radical nature of his perspective. The coincidence of the concepts of body and extension and the inviolability of the principle of plenitude offer dangerous openings for criticism. In fact, this absoluteness winds up by dictating its own law even to God, limiting His freedom and creative power. In the Middle Ages, such a conclusion had been rejected after much discussion; in 1277, there had even been a decree of condemnation by the ecclesiastical authorities of Paris.[66] This condemnation, which was still in force, and the recommendations of the powerful fathers of the Company of Jesus may have influenced Descartes's formulation of the answer and his choice of arguments; evidently glimpsing the long shadow of the accusation of heresy that had already struck Galileo, he tried to avoid its effects by positing an incommensurability between the infinity of creative possibilities at the disposal of the divine power and the limited capacity of the human intellect to understand them.[67] If this and other precautions allowed him to escape being branded as a heretic while still alive, they were not enough to avoid his works being placed on the Index *donec corrigatur* by the Holy Congregation in Rome on 20 November 1663.

The orientations assumed by Descartes in the course of the fertile period of experimentation in European baroscopy thus constantly presupposed the superimposition of the concepts of space and body. In its trajectory, Cartesian thought sometimes approached theses belonging to other traditions; the different intellectual and philosophical contexts tell us that these are superficial analogies which cannot be used to support the view that on the question of the vacuum Descartes wound up by being more Aristotelian than Aristotle himself.[68] The inconceivability of a space without body is for Descartes a metaphysical postulate necessary to guarantee motion and its transmissibility in all circumstances.[69] In the absence of a medium, both the principle of the conservation of quantity of motion and the principle of inertia, principles in irresolvable conflict with Aristotelian philosophy,[70] would remain mere enunciations. In any case, Descartes, unlike Aristotle, kept his discussion of the vacuum within the limits of this world and of human powers of conception. If on more than one occasion he appeared to succumb to the temptation to go beyond these limits, the condemnation of 1277 was a warning not to be underestimated.[71]

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[65] 'Mihi autem non videtur de villâ vnquam re esse dicendum, ipsam à Deo fieri non posse; cum enim omnis ratio veri & boni ab eius omnipotentiâ dependeat, nequidem dicere ausim, Deum facere non posse ut mons sit sine valle, vel vt vnum & duo non sint tria; sed tantum dico illum talem mentem mihi indidisse, ut à me concipi non possit mons sine valle, vel aggregatum ex vno & duobus quod non sint tria, &c., atque talia implicare contradictionem in meo conceptu. Quod idem etiam de spatio, quod sit plane vacuum, siue de nihilo, quod sit extensum . . . dicendum puto; . . . nec etiam dolium adeo vacuum possum concipere, ut nulla in eius cauitate extensio sit, ac proinde etiam in quo non sit corpus; quia vbicunque extensio est, ibi etiam necessario est corpus.' *Oeuvres.*, vol. 5, pp. 223–224. For the English translation see *The Philosophical Writings of Descartes, The Correspondence, op. cit.*, note 16, vol. 3, pp. 358–359.

Similar ideas are present in a letter dated 5 February 1649 sent to the Cambridge Platonist Henry More, *Ibid.*, vol. 5, pp. 240–241, pp. 272–273. On the important theological-philosophical discussion between the French philosopher and his English counterpart, see A. Koyré, *From the Closed World to the Infinite Universe* (Baltimore: J. Hopkins Press, 1957), chap. 5; Mamiani, *op. cit.*, note 24, pp. 59–89 Garber, *op. cit.*, note 50, pp. 151–154.

[66] H. Denifle and E. Chatelain (eds), *Chartularium Universitatis Parisiensis* (Paris: Fratrum Delalain, 1889), vol. 1, pp. 543–555.

[67] See *Meditationes*, IV, in *Oeuvres*, vol. 7, p. 54.

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[68] S. Timpanaro, 'Evangelista Torricelli e la pressione atmosferica', in *Scritti di storia e critica delle scienze* (Firenze: Sansoni, 1952), p. 120.

[69] D. Clarke, 'Physics and Metaphysics in Descartes' Principles', *Studies in History and Philosophy of Science* **10** (1979), 89–111, esp., 102–103.

[70] In Aristotelian physics, bodies themselves contain the motive virtue of tending towards rest, while the medium interacting with the body determines the real amount of motion.

[71] At the end of November 1633 and on February 1634, after the condemnation of Galileo, Descartes wrote to Mersenne concerning his decision not to publish *Le Monde*: 'ie ne voudrois pour rien du monde qu'il sortit de moy un discours, où il se trouvast le moindre mot qui fust desaprouvé de l'Eglise. . . . I'ay voulu entierement supprimer le Traitté que i'en avois fait . . . pour rendre une entiere obeissance à l'Eglise.' *Oeuvres*, vol. 1, A.T., I, p. 271, p. 281. See also p. 285.

BJHP 1994 Article Vol 2 /No. 1

DESCARTES AND THE NATURE OF BODY

(*Principles of Philosophy*, 2.4–19)

Roger S. Woolhouse

As is well known, Descartes holds that 'the nature of matter, on body consists . . . simply in its being something which is extended in length, breadth, and depth'.[1] Because of the criticisms of, for example, Leibniz and Locke, to the effect that extension is not sufficient for matter and that solidity, for example, is necessary too, I shall refer to this as his 'thin' conception of matter, body, or corporeal substance. He does not just state it; he argues for it too. He argues that if we lay aside opinions derived from the senses and make use of the intellect alone we shall see that the nature of matter or body does not consist in its being 'hard or heavy or coloured, or [anything] which affects the senses in any way' (*PP* 2.4).

Having argued for it, Descartes says that '[t]his truth about the nature of body is obscured by preconceived opinions concerning rarefaction and empty space' so that 'there are still two possible reasons for doubting that the true nature of body consists solely in extension' (*PP* 2.5). The preconceived opinion concerning empty space is that 'if we understand there to be nothing in a given place but extension in length, breadth and depth, we generally say not that there is a body there, but simply that there is a space, or even an empty space' (*PP* 2.5). So one reason for dissatisfaction with the 'thin' conception of matter is that extension in length, breadth and depth seems to define 'space' and not 'body'.

At least some of the following sections of the *Principles*, from 6 to 18, discuss and reject this reason for dissatisfaction. It is a mistake to worry that the 'thin' conception of matter fails to distinguish between space and corporeal substance for 'the extension constituting the nature of a body is exactly the same as that constituting the nature of a space' (*PP* 2.11). In the last three of these sections (16–18) there is explicit discussion of the vacuum and Descartes says that since there is body where there is extension there can be no vacuum, no space empty of corporeal substance. Finally, in section 19, Descartes restates the 'thin' conception, and repeats that 'the nature of corporeal substance consists simply in its being something extended'.

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[1] *PP* 2.4 = *Principles of Philosophy*, part 2, section 4, in John Cottingham, Robert Stoothoff, Dugald Murdoch, trans. *The Philosophical Writings of Descartes*, (Cambridge: Cambridge University Press, 1985), vol. 1.

So much by way of what I hope is interpretation-free summary. How is it to be interpreted and understood? What exactly is the problem about the supposed failure to distinguish between space and body? What exactly is Descartes' response to it?

It is easy to suppose that the problem is that the 'thin' conception of matter rules out the possibility of empty space or vacuum; and it is easy to suppose that Descartes' simple response to it is merely to reject the idea of a vacuum or of space empty in the 'philosophical sense' (*PP* 2.16) of the term, on the grounds that indeed it *is* inconsistent with his 'thin' conception of matter. On this approach the problem is: the 'thin' conception rules out a vacuum; and Descartes' response is: *then* a vacuum is ruled out.

I know 'it is easy to suppose' that this is the problem and this the response because it is exactly what I used to suppose. I was not completely alone. Cottingham says that in Descartes' system the vacuum gets ruled out because it is inconsistent with the fundamental definition of matter as no more and no less than what has extension.[2] Kenny says that Descartes deduces that there is no vacuum *from* his 'thin' conception of matter;[3] and Machamer says that 'making use of the premise that matter is only extension' Descartes argues at *Principles* 2.16–18 that 'there can be no vacuum in nature'.[4]

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[2] John Cottingham, *Descartes* (Oxford: Basil Blackwell, 1986), p. 86.

[3] Anthony Kenny, *Descartes: A Study of His Philosophy* (New York: Random House, 1968), p. 204; see also S. V. Keeling, 2d ed. *Descartes* (London: Oxford University Press, 1941), p. 284.

[4] Peter Machamer, 'Causality and Explanation in Descartes' Natural Philosophy', in Peter K. Machamer, Robert G. Turnbull, eds. *Motion and Time, Space and Matter* (Ohio: Ohio State University Press, 1976), p. 173. Williams, too, implies that Descartes' denial of the vacuum depends on his 'thin' conception of matter (*Descartes: The Project of Pure Enquiry* (Harmondsworth: Penguin Books Ltd., 1978), p. 230).

A preconceived opinion concerning 'empty space' is, though, only the second of two 'possible reasons for doubting that the true nature of body consists solely in extension' (*PP* 2.5). The first is a preconceived opinion 'concerning rarefaction', that the same body can vary in extension. Descartes' own explanation of rarefaction (*PP* 2.6) proceeds by way of an example of sponge which enlarges as its pores fill with water or air, and contracts as they are collapsed and air or water is squeezed out. This is merely an analogy and we do, he admits, have to 'infer the existence of pores and gaps which are made larger' in genuine rarefaction, and the matter which fills them is imperceptible to us. But, he says, 'it is very easy for us to see how rarefaction can occur in this way, but we cannot see how it could occur in any other way' (*PP* 2.7).

Now particularly if one has already supposed that the second of the possible reasons for doubt is that the 'thin' conception of matter seems to rule out there being any space empty of body, it is easy — at least if the text is held at a distance from the mind — to suppose that the question of rarefaction turns on this too. It is easy to suppose that what Descartes is facing up to and is against, is the Greek atomists' account of rarefaction according to which it is a matter of the atomic parts of a body becoming separated by vacua. And if one does suppose this one ends up supposing that what Descartes is saying is, 'Rarefaction can't be as the atomists think, because that supposes that vacua are possible; but vacua are not possible because my account of body rules them out. Rarefaction must be as I say.'

Leibniz seems to suppose that Descartes sets his account of rarefaction against one which involves vacua.[5] And this interpretation is not hard to find in our own time. Explaining that expansion of a vapour depends for Descartes on 'an incursion of new matter from the environment to the interstices' of the vapour, Cottingham says that 'part of the reason why this sounds so wrong-headed to us now is that we are used to the idea that a quantity of gas can . . . be spread out . . . as a rarefied cloud over vast areas of empty space. . . . But for Descartes the notion of truly empty space is incoherent'.[6]

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[5] In his comments on the *Principles* he says 'Descartes has admirably explained that . . rarefaction . . . can occur without our having to admit . . . the existence of vacua interspersed within matter' (L. E. Loemker, trans. and ed., 2d ed. *Leibniz: Philosophical Papers and Letters* (Dordrecht: Reidel, 1969), p. 393; see also Alfred G. Langley, trans. and ed., *Leibniz: New Essays concerning Human Understanding* (La Salle, Illinois: Open Court Publishing Co., 1949), p. 699).

The whole of this interpretative understanding of sections 5 to 18 of part 2 Descartes' *Principles* is misinterpretative misunderstanding. In outline they should be read as follows. The second reason for dissatisfaction with Descartes' 'thin' conception of matter, namely that extension in length, breadth, and depth seems to define 'space' and not 'body' is just that. Having set out to define one thing, 'body', Descartes seems to have ended up defining something else, namely 'space', something of which some people have the preconceived opinion that it is different from body. The problem is not a specific problem about how on Descartes' 'thin' conception of matter there could be a vacuum, and the subsequent discussion of it does not consist of question-begging assertion and reiteration. The discussion (which, since sections 8 and 9 concern rarefaction, runs from sections 10 to 15) provides an account of the nature of space and its relation to body which does not presuppose and is completely independent of the 'thin' conception that there is no more to body than dimensionality. In effect these passages say: 'It is suggested I have a problem about the difference between body and space. But, quite apart from what I say of the "thin" nature of body, a correct understanding of the nature of space and its relation to body (whether this is "thin" or as "thick" as you like) shows that there is no real difference between body and space.'

Given what Descartes says in sections 10 to 15 about the relation between space and body the question of the possibility of a vacuum does arise — hence he addresses that at section 16. But since the discussion of sections 10 to 15, about the relation between space and body is completely independent of whether matter is as 'thin' as he says or should be 'thickened up', the question which arises at section 16 about the vacuum is also quite independent of what there is to matter.

What about the rest of what I am claiming is a misunderstanding of these sections? What about the first of the two 'possible reasons for doubting that the true nature of body consists solely in extension' (*PP* 2.5), the preconception about rarefaction? This too has nothing to do with the possibility of the vacuum; and once one sees this, one sees also that the discussion of rarefaction is not the marginal, minor one it might have seemed. It is easy to suppose that while sections 6, 7, and 19 have specifically and solely to do with rarefaction, all the rest discuss the second preconceived opinion, about empty space — a discussion which, to the extent that both preconceived opinions are taken as having something to do with the vacuum, has indirect consequences for rarefaction. In fact, though, Descartes' remark at the end of section 7, that what he has been saying about rarefaction 'will become clearer from what follows', refers quite specifically to the next two sections, 8 and 9. Descartes does not begin to address the second preconception, about 'empty space', until section 10.

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[6] Cottingham, *Descartes*, p. 85. Similarly Keeling says that it is from his view that matter has only spatial characteristics and consequent denial that 'there can be no vacuum' that Descartes deduces rightly that 'the extensity of a particular body is fixed and constant' (*Descartes*, p. 284).

My interpretation of these passages does not require a diagnosis of how the misinterpretation I am replacing arises. Nevertheless, my suggestion is that it comes about like this. One approaches them with a preconceived and completely unacknowledged idea about the relation between space and body, an idea so preconceived and unacknowledged that one naturally unwittingly assumes that Descartes shares it too. What I have in mind is the idea that space is logically independent of body and can, so far as its nature goes, exist without body; body, on the other hand, is not logically independent of space, which 'contains' it. Leibniz describes this in a piece dated 1671: 'Space [is] something . . . extended but nothing else . . .. A *body* is something in space (that is, something not apart from some space), which we perceive we cannot think of without space, though we can think of space without it.'[7]

It appears from Edward Grant's wonderful history of space and the vacuum [8] that essentially this idea of incorporeal extended space, conceptually separate from contained extended body, can be found from the earliest times in atomism, in the sixth century in John Philoponus, increasingly more frequently in the sixteenth century, and, in a classical expression of it, in Newton in the late seventeenth century. It is clear that the nature it attributes to space and its relation to body allows of the possibility of there being a vacuum or empty space and leaves it to other considerations, of which one might be the nature of body, to decide the matter. Indeed, if the nature of body is as Descartes says, then space — on this view of it — seems automatically to become filled by it.

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[7] Loemker, *Leibniz: Philosophical Papers*, p. 143, see also p. 100.

[8] Edward Grant, *Much Ado about Nothing: Theories of Space and Vacuum from the Middle Ages to the Scientific Revolution* (Cambridge: Cambridge University Press, 1981), pp. 19f., 182f., 233f.

In one way it would not be completely unreasonable to suppose that this is Descartes' view about the nature of space and its relation to body, for it seems to be what he espouses ten or so years earlier in *The World*. In that work he speaks as though the possibility of the vacuum is opened but not closed by the nature of space and its relation to body.[9]

But whatever the case with *The World*, the *Principles* does *not* — or so I emphatically claim — suppose this view of space and body. Indeed, and this is an exquisitely ironic twist, *it is precisely this view which is the preconceived opinion of section 8 about the nature of space and body*! In short, what I have called a complete misunderstanding of Descartes results from reading him against the background of an unacknowledged assumption about the relation between space and body, an assumption so unacknowledged that one automatically supposes Descartes makes it too, and so, having done so, one completely fails to realize that this is precisely the assumption against which Descartes proceeds to argue. No wonder if Descartes then seems to be up to something else! Where else could a left-footed beginning like this lead, except into thickets of misunderstanding?

It is high time I substantiated and filled out these claims about how these sections are to be understood. I shall begin with the first of Descartes' two possible reasons there may be for doubting his account of the nature of body, the one concerning rarefaction. It is not merely that his account runs up against a preconceived opinion that matter can be rarefied, or course. It is, rather, that it runs up against a preconceived opinion that it can be rarefied 'in such a way that when rarefied . . . [it] possesses more extension than when condensed'. Explaining this opinion he says, 'Indeed, the subtlety of some people goes so far that they distinguish the substance of a body from its quantity, and even its quantity from its extension' (*PP* 2.5).

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[9] *Philosophical Writings of Descartes*,'vol. 1, pp. 90–91. Though he does not claim to have proved the matter he closes the possibility by appeal to empirical considerations (pp. 85–86).

As I have already said, in his own explanation of rarefaction and condensation Descartes refers to what happens when a sponge is squeezed into a smaller volume: in terms of its individual parts the sponge is no smaller than it was; its parts have simply been rearranged more closely and the air or water which separated them has been squeezed out. His suggestion is that it is along these lines that we are to understand all cases of rarefaction and condensation, as for example that of a gas.

This is what Descartes says rarefaction *is*. What does he say it *isn't*? What is the preconceived opinion concerning it which might be supposed to cast doubt on his 'thin' conception of matter?

According to what I have called an easy misunderstanding, the preconceived opinion is one that rarefaction is a matter of the parts of a body becoming separated, not, as in Descartes' view, by other matter, but by empty spaces or interstitial vacua. Now given that Descartes does come to reject the vacuum, consistency would require him to reject any account of rarefaction that proceeds by appeal to it. But, as I have already claimed, the question of the vacuum does not come up till rather later, till section 16 in fact. And in any case, it is demonstrable that this is *not* the account which is the 'preconceived opinion' concerning rarefaction which might prevent acceptance of Descartes' 'thin' conception of matter. What is?

My description of Cartesian matter as 'thin' turns out to be somewhat infelicitous. Quite possibly it encourages, and so sets up as an Aunt Sally, the very interpretation which I reject — namely that Descartes' central concern in these sections is with the vacuum. And, more to the immediate point, it invites the idea that it has an opposition only with accounts according to which body is 'thicker' than merely extended. Descartes himself often invites this idea. He talks of matter as consisting 'simply' (*PP* 2.4, 19) or 'solely' (*PP* 2.5) in extension. Yet, besides being *no more* than extended, Cartesian matter is also *no less*. It does therefore have an opposition with any account which denies to matter even an essence of extension.

The traditional Aristotelian account of 'prime matter' is just such an account and the conception of rarefaction which goes with it is precisely that 'preconceived opinion concerning rarefaction' which obscures Descartes' own account of matter.

In the earlier work, *The World*, Descartes contrasts his view of matter with that of 'the philosophers'. Using Aristotelian terminology to describe it, he says that matter 'does not have the form of earth, fire, or air, or any other more specific form, like that of wood, stone, or metal'; 'it lacks the qualities of being hot or cold, dry or moist, light or heavy'; and, finally, it lacks taste, smell, sound, colour, light. But we should not think, he says, that what he is describing is 'the "prime matter" of the philosophers.' *Their* matter has been 'stripped so thoroughly of all its forms and qualities that *nothing* remains in it which can be clearly understood' (my emphasis), whereas his is still positively conceived 'as a real, perfectly solid body, which uniformly fills . . . space'.[10] Pleading that *his* matter is perfectly intelligible he says that their's is not, and that it produces 'difficulties in things which seem extremely clear to other men'. 'The whole difficulty they face with their matter arises simply from their wanting to distinguish it from its own quantity and from its external extension — that is, from the property it has of occupying space'. On the other hand, 'the quantity of matter I have described', he says, 'does not differ from its substance any more than number differs from the things numbered. . . . I conceive its extension, or the property it has of occupying space, not as an accident, but as its true form and essence'.

So, in the 'prime matter' of Aristotelian tradition (in which both quantitative forms such as extension and qualitative forms such as colour were taken to be accidental) is matter even 'thinner' than Descartes' own. Even the property of occupying space is inessential to the 'prime matter' or 'the philosophers'. Thin and emaciated as its extended body may be, Cartesian matter at least has body, and in that sense his account of matter is far 'thicker' than that of 'prime matter'. Though one gets from Descartes a clear sense of revolution he was not totally original in his rejection of quantity or extension as an accident, and in his conception of essentially extended matter. Though themselves embodied in the Aristotelian tradition medievals such as William Ockham, and John Buridan, had argued against Aquinas' view that a quantity such as extension is distinct from any substance which accidentally is extended.[11]

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[10] *Philosophical Writings of Descartes*, vol. 1, p. 91.

[11] See Marilyn McCord Adams, *William Ockham* (Notre Dame, Indiana: University of Notre Dame Press, 1987), vol. 1, chap. 6, *passim*, but especially sect. 1.

Possibly implicit in the passage in *The World* and quite explicit in the *Principles* is reference to a supposed distinction, not merely between the substance of a body and its quantity or extension, but rather between a body's extension and its quantity. The allusion is presumably not to the simple fact that extensive form was not taken to be the *only* quantitative form — number, for example, was another. Perhaps it is to some view like that of Franciscus de Marchia according to whom extension was a variable mode of a so-called 'quantity of mass', or of John Buridan who distinguishes the 'magnitude' of a body from its extension.[12]

What is the account of rarefaction and condensation that goes with this merely accidentally extended and qualitied 'prime matter'? Since Descartes clearly has medieval Schoolmen in mind rather than Aristotle himself in his rejection of prime matter, the same will go for what he says of rarefaction. But medieval discussion of this topic is set against the background of Aristotle and I hope it will be sufficient here to outline his position and not dare into its later complications.

Like Descartes, Aristotle was a plenist and denied the existence of vacua or of empty space. Moreover, and unlike for Descartes, the vacuum provides the context for his account of rarefaction.

In the *Physics* Aristotle sets about establishing plenism by way of considering and refuting the arguments that may be put on the other side, in favour of the vacuum. Presumably having in mind the earlier atomists he says that 'there are some who think that the existence of rarity and density shows that there is a void'.[13] In response to this, he marshalls his account of matter and form, potentiality and change, and says that '*our* statement [about rarefaction] is based on the assumption that there is a single matter for contraries'.[14] Thus just as the same matter can be actually hot and potentially cold at one time, actually cold and potentially hot at another, so, '[t]he same matter serves for both a large and a small body'. 'When air is produced from water, the same matter has become something different, not by acquiring an addition to it, but has become actually what it was potentially, and, again, water is produced from air in the same way, the change being sometimes from smallness to greatness, and sometimes from greatness to smallness. Similarly, therefore, if air which is large in extent comes to have a smaller volume, or becomes greater from being smaller, it is the matter which is potentially both that comes to be each of the two.'[15] He says, further, that 'the greatness and smallness of a sensible volume are extended, not by the matters' acquiring anything new, but because the matter is potentially matter for both states; so that the same thing is dense and rare, and the two qualities have one matter'.[16]

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[12] See Adams, *Ockham*, vol. 1, pp. 178, 185.

[13] *Physics* 216b22–24; see also 213b15–18. Quotations from Aristotle are from the translation in R. Mckeon, ed. *The Basic Works of Aristotle* (New York: Random House, 1941).

[14] *Physics* 217a20–217b.

The Aristotelian idea that in rarefaction the extended form of a substance is corrupted and replaced by another, without there being any addition to the substance (as there is in growth) had its supporters and critics in the middle ages.[17] Clearly, it is this idea which is 'the widespread belief of *Principles*, part 2, section 5, that 'bodies can be rarefied and condensed in such a way that when rarefied they provide more extension than when condensed'. It is the 'preconceived opinion about rarefaction' which provides a possible reason for doubting that '[t]he true nature of body consists solely in extension'. To Descartes' mind this account of rarefaction and its underlying view of matter is a 'complete contradiction' and 'unintelligible' — things which, he says in section 7, 'will become clearer from what follows'. What does immediately follow are sections 8 and 9 in which he argues against the idea that matter could be unextended.

What, now, of the second preconceived opinion which Descartes says might obscure the truth of his account of matter? As I have said, the apparent reason for doubt is not that his account rules out the possibility of empty space; it is not that on his account of it matter is so 'thin' that space automatically becomes filled with it. It is simply that in defining one thing, body, Descartes seems to have ended up defining another, space. This will certainly seem a serious problem to anyone who takes the relation between body and space to be that body is 'in' and 'contained by' space. And my suggestion is that it is precisely this supposition, that space is conceptually separate from 'contained' body, which is the 'preconception concerning empty space'. So it is precisely this supposition against which Descartes proceeds to argue. He argues that the nature of space and the relationship between it and body (*on any account of the nature of body*) is not that body is 'in' and 'occupies' space. This supposition is a misconstrual of the relation between corporeality and dimensionality for, or so Descartes argues from sections 10 to 15, corporeality has its own dimensionality, produces its own space, and needs no antecedent space to be 'in' or to 'occupy'.

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[15] *Physics* 217a20–217b.

[16] *Physics* 217b8–10. For some discussion of this account of rarefaction and condensation see Grant, *Much Ado*, pp. 71–3.

[17] Of the first group was Richard Middleton, of the second was William Ockham (see Adams, *Ockham*, vol. 1, p. 178f; Grant, *Much Ado*, pp. 71–3).

Central to the discussion here are the notions of 'internal' and 'external' space.[18] These notions are found by name in the writings of Franciscus Toletus (1532–96), though whether he is Descartes' actual source I do not know. To understand them we must again turn to Aristotle. In Aristotle are found the roots of an approach to space and dimensionality which has a long tradition of opposition to the idea, which I sketched earlier, of an incorporeal extended space, conceptually separate from contained extended body.

In the *Physics* (Book IV) Aristotle gives an account of 'place', the notion we use when we speak of something's occupying a place, of displacement, or of motion as change of place. His considered conclusion is that the place of a body is the inner surface of the body which contains it. A view he rejects is that place is the interval defined by that surface — a view which supposes an independence of place from body and, in effect, the 'preconceived opinion' of which Descartes speaks.

Though basically sympathetic to Aristotle's rejection of any separation of place and body Toletus felt that Aristotle's account of 'place' attempted too much with too little; and so he comes to distinguish between 'external place' and 'internal place'. 'External place' is 'what surrounds the located itself, namely the containing body or its ultimate surface'. Obviously, and as indeed Toletus explicitly confirms, his 'external place' is effectively Aristotle's

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[18] For what follows about Toletus and Suarez I am in debt to Grant. He is not unaware of the connections between Descartes and Toletus, (*Much Ado*, pp. 16–17, 122, 335n33; Edward Grant, 'Place and Space in Medieval Physical Thought', in Peter K. Machamer, Robert G. Turnbull, eds. *Motion and Time, Space and Matter* (Ohio: Ohio State University Press, 1976), pp. 155f). Another similarly low-key recognition of what Descartes' argument is really about in these passages can be found in Richard Sorabji, 'John Philoponus', in Richard Sorajbi, ed. *Philiponus and the Rejection of Aristotelian Science* (London: Duckworth, 1987), pp. 21–2.

'place'. It is also obvious that it is this same notion that appears in Descartes' sections 13 and 15.

It is his introduction of 'internal place' that takes Toletus beyond Aristotle. A similar notion can be found in his contemporary Francisco Suarez (1584–1617), and, earlier, in the fourteenth century, in John Buridan. 'Internal place', Toletus says, is 'the place of the thing [or body, namely] the space itself which the thing occupies within itself in accordance with its corpulence'. The space which a body occupies is, as it were, provided by that body itself. Body and space, Toletus says, 'imply each other as a mutual consequence. For if there is a body, there is a space; and if there is a true space, there is a body in it'. In illustration of this conception of a two-way relationship between corporeality and spatial dimensionality Grant quotes Buridan who, believing with Toletus that material extension and internal space are identical, says that if you were located beyond the last heavenly sphere and were to stretch out an arm then 'before you raise your arm outside this [last] sphere nothing would be there; but after your arm has been raised, a space would be there, namely the dimensionality of your arm'. Clearly, this idea of internal place is completely at odds with the idea that extended bodies are 'contained in' an independent space. This quotation captures it well: 'Physical objects are not in space, but these objects are *spatially extended*. In this way the concept of "empty space" loses its meaning.'[19]

Though I know people who find the idea of 'internal place' of a body perfectly natural, it does seem foreign to others who, no doubt under the influence of twentieth-century versions of late seventeenth-century physics, unthinkingly assume the 'container' view. But, like the Aristotelian world, with its connection between dimensionality and corporeality, the Newtonian world with its separation of the two, was not here to stay — for the last quotation I gave, to the effect that 'physical objects are not in space', is neither from nor about some pre-modern scholastic but from Albert Einstein and speaking for himself.[20]

It is this conception of the relationship between space and body, that spatiality is a function of corporeality, which is being proposed by Descartes in his discussion in sections 10, 11, and 12, about 'internal place'. The detailed points made in section 12, to the effect that 'the difference between space and corporeal substance lies in our way of conceiving them', mirror ones already made by Toletus.[21]

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[19] All the quotations in this paragraph are in Grant, *Much Ado*, pp. 15, 273n43; 'Place and Space', pp. 155, 156.

[20] Albert Einstein, 15th ed. *Relativity, the Special and the General Theory: A Popular*

It cannot be stressed too heavily that this account of the nature of space and its relation to body is completely independent of any question about the 'thickness' or 'thinness' of body. Descartes' claim in paragraph 10 that 'the extension in length, breadth and depth which constitutes a space is exactly the same as that which constitutes a body' does not depend on, and is completely neutral with respect, to the 'thinness' of his matter.

There is a passage which might seem to cause difficulty for my understanding that the arguments in these sections are quite independent of whether the essence of matter is solely or more than extension, and that Descartes is not arguing for an identity of space and body on the basis of his 'thin' conception of matter. Arguing at section 11 that 'there is no real difference between space and corporeal substance', he suggests a way in which 'it is easy for us to recognize that the extension which constitutes the nature of a body is exactly the same as that constituting the nature of a space'. We are to 'attend to the idea we have of some body, for example a stone, and leave out everything we know to be non-essential to the nature of body'. In the end 'nothing remains in the idea of the stone except that it is something extended in length, breadth, and depth'. And this, he says, is 'just what is comprised in the idea of space'.

Since this passage occurs in the course of Descartes' attempt to dispel possible doubts about his 'thin' conception of matter it would, obviously, be no more than dogmatic reassertion if it appeals, as at first sight it certainly does, to that 'thin' conception itself. But even though Descartes asks us to leave out of our idea of a stone 'everything we know to be non-essential to the nature of body', we need not suppose he is asking us to leave it out *as* non-essential. We need not suppose that it matters to what he says here that everything but extension be non-essential. We can suppose he is simply asking us to leave out of the idea of the stone everything

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Exposition (New York: Crown Publishers, 1961), p. vi (quoted in Grant, *Much Ado*, p. 273 n. 43.

[21] See Grant, 'Place and Space', p. 157.

except extension. Since everything except extension has, in section 4, been proved (at least to his satisfaction) to be non-essential to body, a quick way for Descartes to ask us to leave out all but extension is simply to ask us to leave out everything non-essential.

But why should he ask us to leave everything except extension out of the stone? Quite simply, so that we might the more easily reflect on the relation of space to the extension of body. He is trying to get us to see that there is no need for a merely extended and independent space for extended body to be 'in'. He wants us imaginatively to see that a body such as a stone already has its own dimensionality and can of itself provide everything that is supposed to be provided by an independent space.

In effect Descartes is, presumably knowingly, adopting an argument from Aristotle's *Physics* (Book 4, chap. 8). Aristotle asks there how a wooden cube would differ from some supposed space which it occupies if all its attributes except for its volume were separated from it. If the volume of a body 'differs in no respect from its place, why need we assume a place for bodies over and above the volume of each, if the volume is conceived as free from attributes? It contributes nothing to the situation'.

Aristotle's argument is not about what is or is not essential to a body, but rather about the nature of extended space and its relation to extended body. The same goes too, I suggest, for *Principles* section 11, and, indeed, for all the sections from 10 onwards. In them Descartes is neither arguing for nor presupposing his 'thin' conception of matter. He is arguing for an account of the nature of space and its relation to body which, if it holds, holds independently of whether body is so 'thin' as to be solely extension or something 'thicker' as Leibniz, for example, will later argue.

So when, at sections 16, 17, and 18, he comes to argue that 'it is a contradiction to suppose there is such a thing as vacuum' since 'there is no difference between the extension of a space, or internal place, and the extension of a body' he is not arguing *from* his 'thin' conception of matter to there being no difference between space and body and therefore no possibility of empty space. He is, and quite independently of that 'thin' conception, arguing, as indeed a whole tradition had been doing since Aristotle, that in the way it is related to body, the *nature of space* rules out the possibility of empty space.

It is sometimes said that Descartes 'spatialises body', or says that 'matter is space'.[22] What seems to lie behind such assertions is the idea that Descartes begins with the picture of space as something independent of body, adds to this his 'thin' conception of body as mere extension, and so ends up with bodies as nothing other than 'regions of space'. It is, of course, part of that picture of space that its parts or regions logically cannot move, and so the problem is raised for Descartes how body can move. A recent article on Descartes quotes Newton to the effect that 'the parts of space are motionless' and then says that 'Cartesian bodies, since they *are* regions of space, must remain locked forever in their position in the "plenum space" '.[23] The problem, says Hartz, 'lies in supposing that body is in any sense identical with extension . . .. So long as it is, bodily extension . . . will be as immobile as spatial extension'.[24]

As I have argued, however, so far from beginning with the idea of space as something independent of body, it is precisely this idea which Descartes is against, and for reasons having nothing to do with his account of the nature of body. So far from 'spatialising body' or making matter into space, Descartes does quite the contrary.[25] Drawing on a quite different tradition he *corporealizes space*. The 'thinness' of his conception of matter produces no problems about motion, for he does not have the view of space which together with that conception is supposed to produce them. This is not to say, I hasten to add, that Descartes faces *no* problem about motion. For the corporealization of space and the suggestion that there is no space without body has itself always been thought to raise problems for the motion of matter (be it 'thick' or 'thin'). But it has not been my purpose here either to attack or defend what Descartes says. It has been only to suggest how it should be read.[26]

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[22] See for example by Glenn A. Hartz, 'Leibniz on why Descartes' Metaphysics of Body is Necessarily False', in Nicholas Rescher ed. *Leibnizian Inquiries: a Group of Essays* (University Press of America, 1989), p. 34, n. 16.

[23] Hartz, 'Leibniz on Descartes' Metaphysics', p. 30 (cf. Jonathan Bennett, *A Study of Spinoza's Ethics* (Cambridge: Cambridge University Press, 1984), pp. 109–110).

[24] Hartz, 'Place and Space', p. 35.

[25] Cf. Norman Smith, *Studies in the Cartesian Philosophy* (New York: Russell & Russell, 1962), p. 66.

[26] I am grateful to Richard Francks for conversations which helped to work all of this out.

Part IX
Ethics and Anthropology

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The Insufficiency of Descartes' Provisional Morality

Francis P. Coolidge, Jr.

IN THE LETTER to the translator of the *Principles of Philosophy*, Descartes writes:

> Thus the whole of philosophy is like a tree. The roots are metaphysics, the trunk is physics, and the branches emerging from the trunk are all the other sciences, which may be reduced to three principal ones, namely medicine, mechanics, and morals [*la morale*]. By 'morals' I understand the highest and most perfect moral system [la plus parfaite morale], which presupposes a complete knowledge of the other sciences, and is the ultimate level of wisdom.[1]

In the same letter Descartes writes:

> Following on from this, in order to get people to see the purpose I had in publishing my work, I would wish to explain here the order which I think we should follow when we aim to instruct ourselves. First of all, a man who still possesses only the ordinary and imperfect knowledge that can be acquired in the ways explained above should try before anything else to devise for himself a code of morals which is sufficient [*une morale qui puisse suffire*] to regulate the actions of his life. For this is something which permits no delay, since we should endeavour above all else to live well. (*Descartes*, 185–86; *Oeuvres*, 565)

What I would like to note from these two quotations is that the highest branch of Cartesian philosophy is "la plus parfaite morale," while the ground, or first consideration, of Cartesian philosophy is a sufficient, or provisional, morality. Morality is both the first and last consideration of the Cartesian philosopher. Since Descartes urges the reader to begin self-instruction by developing "une morale qui puisse suffire," it seems that an understanding of the Cartesian philosophical project presupposes an understanding of the ground of the provisional morality. The only treatment of the provisional morality occurs in the

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[1] René Descartes, *The Philosophical Writings of Descartes*, vol. 1, trans. John Cottingham, Robert Stoothoff, Dugald Murdoch (Cambridge: Cambridge Univ. Press, 1985), p. 186 (hereafter *Descartes*). When I have found it necessary to cite Descartes' original French, I have made use of the convenient *Oeuvres et Lettres*, ed. A. Bridoux (Paris: Librairie Gallimard, 1952) (hereafter *Oeuvres*), p. 566.

International Philosophical Quarterly Vol. XXXI, No. 3 Issue No. 123 (September 1991)

Discourse on Method.[2] Hence, it seems imperative to examine the provisional morality and to determine its relationship to the philosophical method discussed there. Such an examination gives form to the parts of this essay. The first part gives attention to the peculiar status of the *Discourse*. Descartes offers his account of the method in a fable. The reasons why the *Discourse* must be a fable set important limits on his exposition of the method and the intelligibility of his claim to derive the provisional morality from the method. The second and third parts address the problem of how the provisional morality can be derived from the method; Descartes' claim must be squared against the apparent inability of the method to address matters of morality.

If the provisional morality is a sufficient ground, then it ought to be adequate to regulate the actions of life and ensure that one lives well. Such a judgment takes Descartes at his word. The chief burden of this essay is to show that the provisional morality fails to suffice on both counts. Such a demonstration is the aim of the fourth and fifth parts. In the first place, the provisional morality is incoherent if it is taken to be sufficient to regulate every instance of action. Second, Descartes fails to establish that the contentment to be achieved through the use of the method is true happiness. In the fifth part, I will show that the provisional morality does cohere if it is meant to be sufficient only to ensure this contentment. I will argue, however, that the effort to see the coherence of the morality requires the reader to abandon the effort to use it to regulate action that does not bear on the use of the method. Thus, it cannot be sufficient to ensure that the reader lives well, unless living well is Cartesian contentment. In the end, however, I will conclude that the provisional morality cannot adequately determine the relationship between the law and the Cartesian cultivation of reason; thus, it is insufficient to guide Descartes' actions and ensure that he lives well.

I

In part one of the *Discourse*, Descartes writes:

> My present aim, then, is not to teach the method which everyone must follow in order to direct his reason correctly, but only to reveal how I have tried to direct my own. One who presumes to give precepts must think himself more skilful than those to whom he gives them; and if he makes the slightest mistake, he may be blamed. But I am presenting this work only as a history or, if you prefer, a fable in which, among certain examples worthy of imitation, you will perhaps find many others that it would be right not to

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[2] In the aforementioned letter to the translator of the *Principles*, Descartes refers the reader back to the *Discourse* for ". . . an imperfect moral code [*une morale imparfaite*] which we may follow provisionally [*qu'on peut suivre par provision*] while we do not yet know a better one" (*Descartes*, pp. 186–87; *Oeuvres*, p. 566). Hence, it is apparent that "une morale qui puisse suffire" is to be understood in terms of (what Descartes discusses in the *Discourse* as) "une morale par provision." In a letter to Elizabeth dated August 4, 1645, Descartes writes, "It seems to me that every man can make himself content without any external assistance, provided that he respects three conditions, which are related to the three rules of morality [*auxquelles se rapportent les trois règles de moral*] which I put in the *Discourse on Method*." (The citation is from *Descartes: Philosophical Letters*, ed. and trans. Anthony Kenny [Minneapolis: Univ. of Minnesota Press, 1981], p. 165, and *Oeuvres*, 1193.) These three conditions are "related to," but not to be confused with, the provisional morality. The three conditions are for "every man"; the provisional morality is for the person who seeks to make use of a method that not everyone ought to utilize.

> follow; and so I hope it will be useful for some without being harmful to any, and that everyone will be grateful to me for my frankness. (*Descartes*, 112)

Descartes indicates that he does not intend the *Discourse* to teach a method which everyone should follow in order to reason correctly, because there are aspects of the method which it would not be right for many people to follow. The *Discourse* is Descartes' history written as a fable, so that what is dangerous and not to be followed by all (for example, the process of doubt) will be less apparent than what will not be harmful to any (presumably, the charm in the exaggerated aspects of Descartes' narrative).[3] Descartes hopes that such a way of writing will ". . . be useful for some without being harmful to any." Descartes stresses that only a few will be able to utilize the method in the second part of the *Discourse*:

> The simple resolution to abandon all the opinions one has hitherto accepted is not an example that everyone ought to follow. The world is largely composed of two types of minds for whom it is quite unsuitable. First, there are those who, believing themselves cleverer than they are, cannot avoid precipitate judgements and never have the patience to direct all their thoughts in an orderly manner; . . . Secondly, there are those who have enough reason or modesty to recognize that they are less capable of distinguishing the true from the false than certain others by whom they can be taught; such people should be content to follow the opinions of these others rather than seek better opinions themselves. (*Descartes*, 118)

Descartes leaves open the question of how many people fall into the third class of minds: the class of those who are capable of following the method and directing all their thoughts in an orderly manner. Descartes apparently believed that he was the only one in a position to make full use of the method. He implies this in part six of the *Discourse* when he writes: "In short, if there was ever a task which could not be accomplished so well by someone other than the person who began it, it is the one on which I am working" (*Descartes*, 148).

It seems that the virtue of the reader determines how much of the Cartesian method can be understood and utilized: arguably, the reader must be great-souled, or possess what Descartes describes elsewhere as "generosity," in order to realize a place in the third class of minds.[4] But the deepest understanding of the method is limited to Descartes, because of the insights that accompany making the method one's own. He suggests that he cannot fully convey these insights because they are somehow derivative from both the discovery of the method and a practiced facility in its use. I take Descartes to mean that if a person were to exist who had an understanding of the method equivalent to his own, this person would have discovered the method anew and he or she would have developed an habituation and facility in its use to the extent of Descartes' work. The mythic, or fabled, elements of the *Discourse* explicitly involve the relationship of the method to Descartes' personal history: how Descartes developed the method and how the method both developed and habituated him.

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[3] In his review of existing knowledge in part one of the *Discourse*, Descartes writes that, "the charm [*gentillesse*] of fables awakens the mind, while the memorable deeds told in histories uplift it and help to shape one's judgement if they are read with discretion; . . . Moreover, fables make us imagine many events as possible when they are not" (*Descartes*, 113–14; *Oeuvres* 128–29).

[4] At the beginning of article 156 in *The Passions of the Soul* Descartes writes, "Those who are generous in this way are naturally led to do great deeds, and at the same time not to undertake anything of which they do not feel themselves capable" (*Descartes*, 385).

> As for the benefit that others might gain from the communication of my thoughts, this could not be so very great. For I have not yet taken them sufficiently far: I need to add many things to them before applying them in practice. And I think I can say without vanity that if anyone is capable of making these additions it must be myself rather than someone else—not that there may not be many minds in the world incomparably better than mine, but because no one can conceive something so well, and make it his own [la rendre sienne], when he learns it from someone else as when he discovers it himself . . . . if they [the best minds] wish to follow a plan similar to mine, then in that case I need tell them nothing more than I have already said in this discourse. For if they are capable of making further progress than I have made, they will be all the more capable of discovering for themselves everything I think I have discovered. . . . Besides, by investigating easy matters first and then moving on gradually to more difficult ones, they will acquire habits more useful to them than all my instructions could be. For my part, I am convinced that if from my youth I had been taught all the truths I have since sought to demonstrate, and so had learned them without any difficulty, I should perhaps never have known any others; or at least I should never have acquired the habit and facility [*l'habitude et la facilité*], which I think I have, for always finding new truths whenever I apply myself in searching for them. (*Descartes*, 146–47; *Oeuvres*, 173–75)

From the standpoint of Descartes the account of the method in the *Discourse* is both true and illusory. As already discussed, some of the illusion is provided by the charm of hyperbolic narrative which Descartes hopes will arouse but circumscribe the imagination of those who might be harmed by the dangerous aspects of the method. This level of illusion is intended for the first and second classes of minds. I want to point out, however, that there is a deeper level of illusion affecting the third class of minds which Descartes could not avoid. There is a necessary difference between the content of the *Discourse* and the nature of how Descartes grasped the method and habituated himself to its use. Only Descartes can fully recognize this difference. This difference establishes the deepest level of what it means for the *Discourse* to be a fable. The understanding developed through the discovery of the method and the habituation to its use cannot be made fully evident (clear and distinct) in discourse. Instead, Descartes can only awaken the understanding of the reader. Hence, the *Discourse* must be a fable, an account which lies between the truth of the fully evident and the falsehood of an unveridical image judged to be true. If the *Discourse* must be a fable, then the discursive foundation of Cartesian science, the exposition of the method, is irreducibly mythic.[5] This has important implications which will be drawn later. At the end of part four I will argue that the reasons why the *Discourse* must be a fable are the very ones that will make it impossible for Descartes to make fully clear how he derives the provisional morality from the method.

[5] Hence the other explicit account of the method, *The Rules for the Direction of the Mind*, is both incomplete and unpublished because it omits the mythic context which establishes both the origin and limits of Descartes' exposition of the method. I agree with Michael Davis when he argues that the account of the method in the *Discourse* is "deeper" because it attempts to account for the origin of the method. (See his *Ancient Tragedy and the Origins of Modern Science* [Carbondale: Southern Illinois Univ. Press, 1988], p. 52.) Yet (like Davis) I also want to say that the *Rules* offers a more comprehensive formulation of the precepts of the method. (See note 9 below.)

II

Descartes has urged his followers to begin by developing a provisional morality. Why is it necessary for the Cartesian philosopher to be concerned with a provisional morality?

The answer lies in an examination of the first rule of Descartes' philosophical method as it is presented in the second part of the *Discourse*:

> The first was never to accept anything as true if I did not have evident knowledge of its truth: that is, carefully to avoid precipitate conclusions and preconceptions, and to include nothing more in my judgements than what presented itself to my mind so clearly and so distinctly that I had no occasion to doubt it. (*Descartes*, 120)

If the Cartesian philosopher begins reasoning according to this rule, then no moral standards can be accepted as true. Moral norms are always conventional to a degree which renders them dubitable. If the Cartesian philosopher, explicitly dedicated to developing a most perfect moral system, begins with the first rule, then the Cartesian project ends in nihilism. Secondly, the philosopher who strictly adheres to the first rule will be unable to act, because everyday decisions cannot be made in a way that escapes all doubt of their worthiness. In short, the first rule of the method is so strict that one cannot live by it. How then ought the Cartesian philosopher to live, if not by the method? At the beginning of part three of the *Discourse*, Descartes indicates that he developed his provisional morality in response to this difficulty:

> Likewise, lest I should remain indecisive in my actions while reason obliged me to be so in my judgements, and in order to live as happily as I could during this time, I formed for myself a provisional moral code [*une morale par provision*] consisting of just three or four maxims, which I should like to tell you about. (*Descartes*, 122; *Oeuvres*, 140–41)

How Descartes arrived at his provisional morality is obscure. On the one hand, it would seem that the provisional morality cannot be derived from Descartes' method, since the provisional morality is adopted precisely because the method would force Descartes to ". . . remain indecisive in my actions while reason obliged me to be so in my judgements. . . ." The provisional morality is adopted precisely because the criterion of the method is too rigorous to be used as a criterion for judgments in everyday life. Yet Descartes writes in the prologue to the *Discourse* that in the third part are ". . . some of the moral rules he has derived from [tirée de] this method" (*Descartes*, 111; *Oeuvres*, 125). How can the maxims of the provisional morality be derived, or drawn, from the method?

The same prologue cited from the beginning reads:

> If this discourse seems too long to be read at a sitting you may divide it into six parts. In the first you will find various considerations regarding the sciences; in the second, the principal rules of the method which the author has sought; in the third, some of the moral rules he has derived from this method. (*Descartes*, 111)

It is important to note that Descartes claims to be presenting the "principal rules of the method" in the *Discourse*; he does not claim to present all the rules of the method, or to present an analysis of these rules. In the second part of the *Discourse* Descartes comments that:

> Now a multiplicity of laws often provides an excuse for vices, so that a state is much better governed when it has but few laws which are strictly observed; in the same way, I thought, in place of the large number of rules that make up logic, I would find the following four to be sufficient, provided that I made a strong and unswerving resolution never to fail to observe them. (*Descartes*, 120)

In this passage Descartes argues that the four rules of the method are kept at this small number because, ". . . a multiplicity of laws often provides an excuse for vices, so that a state is much better governed when it has but few laws which are strictly observed." Order in thought is understood on the basis of what constitutes good order in the state. One is reminded of Plato's *Republic*, in which an account of the virtue of justice is attempted on the basis of the "look" (*idea*) of justice in the polis.[6] The foundational difficulty in the Socratic account is the assumption of a likeness (*homoiotēs*) between the look of justice in the polis and the look of justice in the soul.[7] Why should the laws of the method be modeled on the laws of the state? Even if they should be, is it evident that a state with few laws is better ruled than one with many laws? When Descartes is exacting in his effort to order the reflections of the mind he is forced to introduce far more than the four rules of the method in the *Discourse*. It seems that the four rules of the *Discourse* are reductions from the twenty-one rules of the *Rules for the Direction of the Mind* (which are themselves incomplete).[8] Descartes has indicated in the *Discourse* that the four rules of the method would be ". . . sufficient, provided that I made a strong and unswerving resolution never to fail to observe them." What happens when one must fail in the observance of these four rules (for example, when one considers questions of morality) is left unresolved. There are two possibilities: either other rules of the method must be invoked besides these four (which are no longer "sufficient"), or the method is incapable of addressing moral problems. If the latter is the case, then the provisional morality of the *Discourse* is independent of the method and Descartes' claim to have derived the morality from the method is unintelligible.[9] If other rules of the method must be invoked, then it will be necessary to examine the *Rules* in order to discover how the provisional morality can be derived from the method.

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[6] See *Republic* 368c 4–369b 4 for the "resolution" to investigate justice in this way.

[7] *Ibid*. 369a 1–3.

[8] The point holds as long as the four rules of the *Discourse* can be correlated with the *Rules*. Both L. J. Beck in *The Method of Descartes* (Oxford: Clarendon Press, 1952), p. 154 and Etienne Gilson in *Discours de la Méthode* (Paris: J. Vrin, 1947), p. 196 take the accounts of the method in the *Rules* and the *Discourse* to be essentially the same. I concur with Pamela Kraus in " 'Whole Method': The Thematic Unity of Descartes' Regulae," *The Modern Schoolman* 63 (1986), 84, as she argues that the *Rules* are more comprehensive; she rightly observes the first rule of the *Rules* is preliminary to methodology in the sense advocated by the first rule of the *Discourse*. E. M. Curley's argument in *Descartes Against the Skeptics* (Cambridge, MA: Harvard Univ. Press, 1978), pp. 21–45 that the two methods are distinct founders on the claim that only the method of the *Discourse* recommends the principle of doubt. For a critique of Curley's argument, see the review of Peter Schouls in *Philosophical Books* 20 (May 1979), 61–66.

III

Rule one reads: "The aim of our studies should be to direct the mind with a view to forming true and sound judgements about whatever comes before it" (*Descartes*, 9).

Descartes begins his account of the method in the *Rules* by making it open-ended in scope. The mind should be directed towards the pronouncement of true and sound judgments on all matters that come before it. In the seventh rule, Descartes makes it clear that a true and sound judgment on some matters could be that no certain judgment is possible concerning these matters.

> So even though the object of our inquiry eludes us, provided we have made an enumeration we shall be wiser at least to the extent that we shall perceive with certainty that it could not possibly be discovered by any method known to us. If we have managed to examine all the humanly accessible paths towards the object of our inquiry (which we often do), we shall be entitled confidently to assert that knowledge of it lies wholly beyond the reach of the human mind. (*Descartes*, 26)

The second rule reads: "We should attend only to those objects of which our minds seem capable of having certain and indubitable cognition" (*Descartes*, 10). Clarifying the meaning of this rule, Descartes writes:

> So, in accordance with this Rule, we reject all such merely probable cognition and resolve to believe only what is perfectly known and incapable of being doubted. . . . Nevertheless, if we adhere strictly to this Rule, there will be very few things which we can get down to studying. . . . Accordingly, if my reckoning is correct, out of all the sciences so far devised, we are restricted to just arithmetic and geometry if we stick to this Rule. (*Descartes*, 10–11)

[9] This seems to be the conclusion of Beck, since in *Method* (p. 4) he asserts that the maxims of the provisional morality, ". . . cannot be said to have any logical connection with the rules of the method." Beck, however, does not explicitly address Descartes' claim to have derived the provisional morality from the method. As far back as 1689 Huet argued that Descartes could not have derived his provisional morality from the method, since he borrowed it from the ancients (cited by Gilson, *Discourse*, p. 81). Gilson (ibid.) following Levi-Bruhl, slights the problem by suggesting that "tirée de" means "what is needed by": the method needs a provisional morality if we are to put it to use while living a practical life. Gilson slides over the question of the "tirée de": how Descartes "pulls out" the particular maxims he does. Davis, *Tragedy* (p. 56) says ". . . the connection between the rules of the method and the rules of morality is initially quite dark, . . ."; he offers an illuminating account of how the provisional morality has a structure drawn from the purpose of the method, but he does not clarify this dark connection between the rules of the method and the rules of morality. Responding to Gilson, Robert Cummings in "Descartes' Provisional Morality," *Review of Metaphysics* 9 (1955), 207–35, makes a strenuous effort to show that the provisional morality is derived from the four rules of the method discussed in the second part of the *Discourse*. In order to do so, he is compelled to argue that the whole account of the *Discourse* is derived from these rules. He takes no account of the fable of the *Discourse*; he is forced to argue that the four rules apply independently and even unsequentially within the *Discourse* even though this is contrary to Descartes' order of method.

The first rule of the method (in the *Rules*) involves directing the mind ". . . with a view to forming true and sound judgements about whatever comes before it." The second rule restricts the scope of objects that ought to come to the mind's attention to those objects of which it is possible to gain indubitable knowledge. I want to argue that the provisional morality is derived out of the movement from the first to the second rule. For if the mind ought to consider only those objects of which it may have indubitable knowledge, then the individual must be living the kind of life in which moral considerations never merit attention. The attempt to move from adherence to rule one to adherence to rule two brings the question of how to live into the foreground. It is possible to adhere to the second rule only if the question of how to live can be resolved "truly and soundly" in accord with the first rule. Use of the second rule presupposes a certain kind of life derived from the first rule in light of an anticipated effort to adhere to the second. Such a life must not engage the attention of judgment, but rather leave the mind free to consider arithmetic and geometry (and presumably any other objects of indubitable knowledge).[10]

The complete absence of any discussion of the kind of life presupposed by the second rule of the *Rules* is explainable if it is recognized that the *Rules* are incomplete and not intended for publication; when the method was explicated in a way suitable for publication it was necessary for Descartes to spell out the kind of life presupposed by the second rule.[11] Here a difficulty emerges. When describing the kind of life presupposed by the second rule, Descartes fails to adhere to the criterion of knowledge formulated in his discussion of the second rule. For he has written, "So, in accordance with this Rule, we reject all such merely probable cognition and resolve to believe only what is perfectly known and incapable of being doubted" (*Descartes*, 10). On Cartesian grounds, Descartes' description of the kind of life presupposed by the second rule falls between certain knowledge and falsehood. It falls into the category of what Descartes termed "fable" when he discussed the nature of his own life in light of his use of the method. On this interpretation, the provisional morality is an attempt appropriately to axiomatize (in the form of foundational maxims) the fable of life presupposed by Descartes' adherence to the second rule of the method. As already discussed, the fable of the provisional morality is derived from Descartes' adherence to the first rule of the *Rules*, a rule which requires the mind to make true and sound judgments about whatever comes before it. But what is a true and sound judgment about a matter that cannot be judged in an indubitable manner? This is the perplexity of the provisional morality.

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[10] In the clarification of the second rule discussed above, Descartes refers to the "sciences so far devised." Of the existing sciences, only arithmetic and geometry can be studied while adhering to the second rule. In the *Rules* Descartes intends to found a new science that unites and extends the domains of the mind's indubitable cognitions.

[11] When Descartes discussed the *Discourse* with Burman, he remarked that, "The author does not like writing on ethics, but he was compelled to include these rules because of people like the Schoolmen; otherwise, they would have said that he was a man without any religion or faith and that he intended to use his method to subvert them." *Descartes' Conversation with Burman*, trans. John Cottingham (Oxford: Clarendon Press, 1976), p. 49. Henri Gouhier, however, in *Descartes: Essais sur le "Discours de la Méthode," la Métaphysique et la Morale* (Paris: J. Vrin, 1973), pp. 246–47, rightly argues that the political and philosophical reasons for the provisional morality are not opposed to each other. The political considerations which compelled Descartes to write his provisional morality are not incompatible with the methodological reasons that make it necessary for the Cartesian.

IV

The first maxim of the provisional morality is actually a composite; it can be analyzed into the following parts:

1) Obey the laws and customs of the country in which one resides.
2) Follow the religion of one's upbringing.
3) Note the opinions of the most sensible men and follow the most moderate of these opinions.
    a) Conduct, rather than speech, reliably reveals the opinions that people actually hold.
    b) Promises which restrict one's freedom count as instances of immoderate conduct.

> The first was to obey the laws and customs of my country, holding constantly to the religion in which by God's grace I had been instructed from my childhood, and governing myself in all other matters according to the most moderate and least extreme opinions—. . . I thought too that in order to discover what opinions they [the most sensible men] really held I had to attend to what they did rather than what they said. . . . In particular, I counted as excessive all promises by which we give up some of our freedom. (*Descartes*, 122–23)

There are several important difficulties posed by the first maxim. First, its coherence is not obvious. The religion of one's upbringing may not always be in harmony with the laws and customs of the country in which one resides. The problem is not avoided by taking "my country" to refer only to one's native land. After formulating his provisional morality, Descartes roamed about the world. Second, it is not clear how one is to identify the most sensible men who have the most moderate opinions. How is it to be decided which opinions are the most moderate in nature? The problem is implicit in the following passage: "For I had begun at this time to count my own opinions as worthless, because I wished to submit them all to examination, and so I was sure I could do no better than follow those of the most sensible men" (*Descartes*, 122).

If Descartes is unsure of his own opinions, why should he follow the opinions of others? If Descartes doubts the veracity of his own judgments, why does he not doubt the veracity of his judgment that certain men have judgments that ought to be followed? He goes on to argue:

> I thought too that in order to discover what opinions they really held I had to attend to what they did rather than what they said. For with our declining standards of behaviour, few people are willing to say everything that they believe; and besides, many people do not know what they believe, since believing something and knowing that one believes it are different acts of thinking, and the one often occurs without the other. (*Descartes*, 122)

Descartes introduces a new difficulty: the most sensible men may conceal their real opinions. In addition, many (not necessarily the most sensible) do not know their real opinions. Descartes tries to solve these difficulties by arguing that the real opinions of people are revealed by their actions. The problem of finding the most moderate opinions of sensible men is compressed into the problem of determining what constitutes the most moderate behavior. It is the most moderate behavior of the most sensible men that reveals the "most moderate and least extreme" opinion that Descartes seeks. What is the most moderate behavior that ought to be adopted? Descartes writes:

> Where many opinions were equally well accepted, I chose only the most moderate, both because these are always the easiest to act upon and probably the best (excess being usually bad), and also so that if I made a mistake, I should depart less from the right path than I would if I chose one extreme when I ought to have pursued the other. (*Descartes*, 122–23)

Descartes' position is that the most moderate opinion is always the easiest to act upon: hence, that it is the easiest to put into practice is a justification and sign of the most moderate opinion. But it is not evident that what is easiest to put into practice is always a reflection of the most moderate opinion. Indeed, immoderate behavior is the easiest practice for the one who is habituated to immoderation. Descartes' solution presupposes that he knows he is already moderate when this is ostensibly amongst what he claims to doubt. He adds:

> In particular, I counted as excessive all promises by which we give up some of our freedom. It was not that I disapproved of laws which remedy the inconstancy of weak minds by allowing us to make vows or contracts that oblige perseverance in some worthy project (or even, for the security of commerce, in some indifferent one). But I saw nothing in the world which remained always in the same state, and for my part I was determined to make my judgements more and more perfect, rather than worse. For these reasons I thought I would be sinning against good sense if I were to take my previous approval of something as obliging me to regard it as good later on, when it had perhaps ceased to be good or I no longer regarded it as such. (*Descartes*, 123)

This last part of the first maxim poses the most serious problem for the coherence of the composite. It seems to undercut the entirety of what precedes it. What precedes it could be summarized as, "Follow one's religion, the law, and act the way the most moderate do." Despite Descartes' disclaimer that he does not "disapprove" of the laws which enforce the promises of weak minds, he considers it "excessive," or immoderate, to limit his own freedom through any promise whatsoever. (It is important to recall that Descartes believed himself to have the highest place in the third class of minds.) Why does Descartes consider such a limitation to be immoderate? Curiously, the limitation of one's personal freedom is considered excessive by Descartes; the implication is that unlimited freedom is moderation. Is this understanding of moderation one of "the most moderate and least extreme opinions"? If it is not, why should Descartes follow his own judgment on this matter while in other matters following "the most sensible men"? It is worth observing some of the consequences: the Cartesian who follows this part of the first maxim ought never to marry, borrow, lease, purchase, sell, employ, or be employed. What is most disturbing is Descartes' apparent avoidance of the social contract in its broad sense, his avoidance of all the limitations imposed by the *nomoi* of his country of residence. For he has written, ". . . I would be sinning against good sense if I were to take my previous approval of something as obliging me to regard it as good later on, when it had perhaps ceased to be good or I no longer regarded it as such."

Descartes seems to be saying, "Obey the law, but if at some time it no longer 'meets your approval,' then break the law." Under what circumstances would a law no longer meet Descartes' approval so that he felt obliged to break it? Is not the provisional morality supposed to free the Cartesian philosopher from having to consider moral problems such as whether or not the law ought to be obeyed at a particular point in time?

The second maxim of the provisional morality is the maxim of hyperbolic certainty. It could be summarized as: once one has made up one's mind concerning a course of action, one should act decisively as if one's judgment about this course of action was indubitable.

> My second maxim was to be as firm and decisive in my actions as I could, and to follow even the most doubtful opinions, once I had adopted them, with no less constancy than if they had been quite certain. . . . since in everyday life we must often act without delay, it is a most certain truth that when it is not in our power to discern the truest opinions, we must follow the most probable. Even when no opinions appear more probable than others, we must still adopt some; and having done so we must then regard them not as doubtful, from a practical point of view, but as most true and certain, on the grounds that the reason which made us adopt them is itself true and certain. (*Descartes*, 123)

This second maxim is difficult to understand. It would seem, on Cartesian grounds, that judgments which are not indubitable are subject to error; hence, the Cartesian should be prepared to revise continually judgments that are doubtful. But Descartes' conclusion is exactly the reverse: once a judgment is made about a matter of action, it should be treated as if it was indubitable. Descartes offers two justifications for this maxim. The first is an argument that one ought not to revise continually judgments about what to do. For if one is continually revising judgments about what to do, then nothing is accomplished. It is better to accomplish something rather than nothing.

> In this respect I would be imitating a traveller who, upon finding himself lost in a forest, should not wander about turning this way and that, and still less stay in one place, but should keep walking as straight as he can in one direction, never changing it for slight reasons even if mere chance made him choose it in the first place; for in this way, even if he does not go exactly where he wishes, he will at least end up in a place where he is likely to be better off than in the middle of a forest. (*Descartes*, 123)

The difficulty with this justification is that it is not evident that all paths lead out of the forest; some may lead to an abyss. It is not evident that all activity, resolutely followed, is good. It seems unnecessary to cite historical examples of individuals or groups led to self-destruction by resolute actions that were never altered. No doubt those who destroyed themselves believed that they were acting on the most probable opinion.

The second justification which Descartes offers for the second maxim is implicitly an argument that one ought not to revise the judgment that one's course of action was good. For if one never revises the judgment that one's course of action was good, then one avoids the troubles of regret and remorse.

> By following this maxim I could free myself from all the regrets and remorse which usually trouble the consciences of those weak and faltering spirits who allow themselves to set out on some supposedly good course of action which later, in their inconstancy, they judge to be bad. (*Descartes*, 123)

By adopting the second maxim, Descartes avoids regrets and remorse because he never judges that he erred in his moral judgments. Once Descartes makes a judgment that a course of action is good he is resolute in his evaluation; he never decides that what he thought was good, was actually evil. This teaching is so dangerous, it is startling that Descartes offers it as a justification for a maxim of morality. The objection made to the first justification of this second maxim applies here as well: it is not evident that any activity, resolutely followed, is good. What is most disturbing about the second justification is its elimination of guilt. One avoids the remorse of hindsight, because one never judges oneself to have done what is evil. Put more strongly, the suggestion is that, with respect to everyday matters of action, good and evil are merely what one judges them to be; hence, if one never judges oneself to have done evil, it follows that one never did. On this interpretation, Descartes' second maxim is indistinguishable from nihilism.[12]

It should be noted that if the second maxim is applied self-referentially to the entire provisional morality, then the provisional morality cannot be provisional. If the second maxim means that once opinion concerning action is adopted such opinion must be resolutely adopted, then the maxims of the provisional morality must be resolutely, and not provisionally, accepted. Here a difficulty emerges. It might be argued that Descartes resolutely accepts the provisional quality of the provisional morality; hence, the provisional morality is provisional or conditional upon Descartes' judgment that the provisional morality has not been superceded by other considerations such as the development of a perfect moral system. But what would it mean to accept resolutely the provisional quality of an opinion? How is this different from saying that the opinion is provisional? This difficulty is sharpened when Descartes' justification of the last part of the first maxim is recalled:

[12] See Davis, *Tragedy*, p. 59: "The problem, then is guilt. Weak minds (les esprits faibles) feel it because they do not realize that mistakes owing to necessary ignorance are not moral defects. However, if they are not responsible for their lack of knowledge of good and evil then they cannot sin." In response to a concerned correspondent ("S.P."), Descartes tries to dismiss the troublesome implications of the second maxim by arguing that the second maxim is concerned with resoluteness in action, not resoluteness of judgment. We are to follow resolutely the best judgment which bears on action until we arrive at a better judgment concerning action (cited by Gilson, *Discours*, p. 242). But Descartes' resoluteness in action implies a resoluteness of judgment. While Descartes is resolute in action he is not acting to seek a better judgment about his course of action. Moreover, his exaltation of freedom from the social contract, his reduction of moderation to ease of practice, and his adherence to methodological doubt would seem to make it impossible for him to revise judgments, except in terms of what will serve the cultivation of his reason. Despite the salutary morality for "every man" in Descartes' aforementioned letter to Elizabeth, all other matters of action are, so to speak, beyond good and evil. (See my discussion in part five.)

> But I saw nothing in the world which remained always in the same state, and for my part I was determined to make my judgements more and more perfect, rather than worse. For these reasons I thought I would be sinning against good sense if I were to take my previous approval of something as obliging me to regard it as good later on, when it had perhaps ceased to be good or I no longer regarded it as such. (*Descartes*, 123)

I submit that if these lines are taken seriously, then the second maxim is unintelligible. The second maxim and last part of the first maxim do not cohere.

The argument of the third maxim concerns Descartes' happiness. Contentment is possible only if one does not desire more than the attainable. One should desire only the attainable because if one desires only this, then one achieves (what earlier stoic philosophers termed) happiness. The praise of the mastery of thought in the third maxim depends on the success of this argument; mastery of thought ensures that one does not desire more than what can be obtained.

> My third maxim was to try always to master myself rather than fortune, and change my desires rather than the order of the world. In general I would become accustomed to believing that nothing lies entirely within our power except our thoughts, so that after doing our best in dealing with matters external to us, whatever we fail to achieve is absolutely impossible so far as we are concerned. This alone, I thought, would be sufficient to prevent me from desiring in future something I could not get, and so to make me content. For our will naturally tends to desire only what our intellect represents to it as somehow possible; . . . Making a virtue of necessity, as they say, we shall not desire to be healthy when ill or free when imprisoned, any more than we now desire to have bodies of a material as indestructible as diamond or wings to fly like birds. . . . In this, I believe, lay the secret of those philosophers who in earlier times were able to escape from the dominion of fortune and, despite suffering and poverty, rival their gods in happiness [*félicité*]. (*Descartes*, 123–24; *Oeuvres*, 143)

The argument of the third maxim takes contentment to be convertible with the stoic's conception of happiness (*félicité*). Hence, the argument has no import, unless this conception is shown to be right. The support offered the stoic conception is quite weak: "For our will naturally tends to desire only what our intellect represents to it as somehow possible; . . . making a virtue out of a necessity . . . we shall not desire to be healthy when ill or free when imprisoned." This support is tacitly undermined later. Descartes admits in his concluding remarks that he could not have limited his desires, ". . . had I not been following a path by which I thought I was sure to acquire . . . all the true goods within my reach" (*Descartes*, 124–25). The arguments of the *Discourse* never move to establish that Descartes' contentment is true happiness; such a demonstration would require him to show that the goods within his reach are sufficient for what is true happiness. The ostensibly definitive morality of part six of the *Discourse* does not satisfy such a requirement; if health was truly the first good in this life (a claim not justified anywhere in the *Discourse*), and if Descartes could show that his nascent science of medicine could acquire this good for both mind and body, then he would still need to show that the acquisition of this good was sufficient for true happiness. The central difficulty posed by the third maxim is the problem of what ought to be desired. On the one hand, if what is desired is not important to happiness, why should one bother to complete the Cartesian project of cultivating one's reason? Why not sit in a garden lost in the tranquility of self-mastery? On the other hand, if what is desired does make a difference to one's happiness, then how can Descartes argue that certain philosophers, despite suffering and poverty, were able to rival their gods in their happiness? If Descartes is not a pagan, then his suggestion is that these philosophers experienced an illusory happiness since their gods do not exist.

Descartes does not explicitly discuss a fourth maxim; instead, he ventures to conclude his moral code. His concluding remarks can be summarized as follows. First, he reviews the activities of men and determines that the best activity for him is cultivating his reason because this cultivation is more important and satisfying than anything else. Second, he reflects on the provisional morality and observes that the provisional morality is founded on the project of developing his knowledge. Any opinions that he accepts from others are accepted on the condition that they will be examined later. Last, he attempts to address the central difficulty posed by the third maxim. He is able to be content and restrain his desires only if he believes that by cultivating his reason he will be assured of obtaining all the good things that he could possibly obtain.

> Finally, to conclude this moral code [*cette morale*], I decided to review the various occupations which men have in this life, in order to try to choose the best. Without wishing to say anything about the occupations of others, I thought I could do no better than to continue with the very one I was engaged in, and devote my whole life to cultivating my reason and advancing as far as I could in the knowledge of the truth, following the method I had prescribed for myself. Since beginning to use this method I had felt such extreme contentment that I did not think one could enjoy any sweeter or purer one in this life. Every day I discovered by its means truths which, it seemed to me, were quite important. . . . Besides, the sole basis of the foregoing three maxims was the plan I had to continue my self-instruction. . . . I should not have thought myself obliged to rest content with the opinions of others for a single moment if I had not intended in due course to examine them using my own judgement; . . . Lastly, I could not have limited my desires, or been happy [*content*], had I not been following a path by which I thought I was sure to acquire all the knowledge of which I was capable, and in this way all the true goods within my reach. (*Descartes*, 124–25; *Oeuvres*, 143–44)

A crucial question that arises here is why Descartes considers himself justified as he dedicates his life to the cultivation of his reason. If the second maxim is taken seriously, then since Descartes is already engaged in the task of cultivating his reason, it follows that he must treat his judgment to do so as indubitable and not forsake his task. Hence, his "conclusion" that he should devote himself to advancing his knowledge in accord with his method. The difficulty is that anything whatsoever is justified by the second maxim; Descartes' affirmation of continuing to live in accord with his method cannot be distinguished from madness. His silence about how the lives of other men are to be ranked is consistent with his inability to rank them. Neither the method, nor the provisional morality, can provide more than an opinion about the activities of other people, an opinion which cannot be reevaluated until some indeterminate point in the future.

It is difficult to see how Descartes will reevaluate the opinions that he accepts as he formulates his provisional morality. He has indicated in his concluding remarks that he will evaluate later the opinions which he now accepts from others.

But does not the second maxim compel him to stand behind the opinions he has adopted? Is not the purpose of the provisional morality to free Descartes from worrying about matters of morality? Does he not make use of a method which must exclude moral questions from its domain, lest he remain indecisive in his actions while reason obliges him to be so in his judgments?

Descartes has argued in the conclusion of his moral code that, ". . . the sole basis of the foregoing three maxims was the plan I had to continue my self-instruction." This means that if (as I have argued) the provisional morality is derived in the movement from rule one to rule two in the *Rules,* then the provisional morality is a series of "true and sound judgements," given the assumption that the method ought to be put to use. This is much weaker than saying that the provisional morality is unconditionally a series of true and sound judgments. The intelligibility of Descartes' claim to have derived the provisional morality from the method is obscured by the need to include considerations which have nothing to do with the method, but instead have to do with what is presupposed by the use of the method.

In the end, Descartes' claim to have derived the provisional morality from the method cannot be completely transparent, because Descartes must explicate in a fable how he has lived according to the method. As already discussed, Descartes cannot explain in a fully evident way how to make the method one's own. He has suggested that he cannot fully convey the insights gained in the discovery and habituation of the method. I take this to imply that he cannot explain the discovery of how one leaps from the *Rules* to an understanding of how to apply the method to particular problems one encounters (such as the problem of how to live in order to cultivate one's reason). This leap involves insight that all those who are to make use of the method must discover for themselves. It follows that Descartes cannot make fully evident the derivation of his judgments about the kind of life that is presupposed if one is to live according to the second rule of the method. The problem of the provisional morality is the question of how to live in relation to the project of cultivating one's reason. Descartes thinks he knows how to live, given his commitment to his methodology of reason and his understanding of its use. But the reader, who has neither discovered the method, nor been habituated by it, cannot adequately understand the derivation of how to live in order to make use of it.

V

Although the derivation of the provisional morality cannot be completely transparent, it is possible to see a coherence to the maxims in light of Descartes' concluding remarks. If ". . . the sole basis of the foregoing three maxims was the plan I had to continue my self-instruction . . . ," then the unity and coherence of the maxims of the provisional morality can be understood in terms of what is expedient for making use of the method. I take Descartes' concluding remarks to include an element of reflection on the preceding maxims. The exaggeration of fable that is present in the provisional morality is twofold. First, it is the appearance that these maxims are coherent. Second, it is the appearance that they are sufficient to regulate every instance of action and to ensure what is truly known to be happiness. If the provisional morality is seriously taken to be sufficient to regulate every instance of action, then it dissolves into incoherence, because of the conflict extant between the freedom to revise judgment (affirmed in the last part of the first maxim) and the necessity of resolute action (discussed in the second maxim). If the provisional morality is to cohere, then the maxims must differ in scope. Certain actions must be resolutely followed and not undermined by the effort to revise judgments continually. On the other hand, other actions must be subject to revisions of judgment and not resolutely followed. If these latter actions are constantly subject to revisions of judgment, then the provisional morality cannot offer rules which are sufficient to determine whether or not these actions ought to be performed. Hence, the provisional morality cannot be sufficient to regulate each occasion of action. The reflective dimension of the concluding remarks implicitly sights the limits of what the provisional morality can provide. As these limits are sighted, the provisional morality gains a unity which provides it with coherence. This coherence, however, is achieved only by limiting its sufficiency.

I take the concluding remarks to suggest something about the sort of insight that follows the discovery of and habituation to the method. The reflective dimension of the concluding remarks points to the sort of insight that is required to understand how the provisional morality was derived. Such insight should enable one to understand why the provisional morality is a set of true and sound judgments about the way of life that is presupposed by the use of the method. On this interpretation, the provisional morality loses its incoherence in light of the insight that comes as the method is put to use. It is possible to say something about the insight involved in understanding the coherence of the provisional morality, even if, in the end, Descartes cannot fully convey what this insight is.

Reflection on the movement from the first maxim to the third reveals it to be a movement from what provides social and political order (laws and customs) to activity within that order (resolute actions) to considerations about the relation of order to the happiness in contentment (happiness is ordered desire). Thus, the movement from the first maxim to the third is the subordination of social and political order to the process of ordering within Descartes' mind. It follows that if there are contradictions between, or within, the maxims, these contradictions are to be resolved on the basis of the third maxim. The third maxim mediates between the moral questions of social order and the ordered beginning of the Cartesian cultivation of reason. The third maxim addresses the happiness (*félicité*) to be found in contentment. As Descartes concludes his discussion of the provisional morality, he writes:

> . . . we need only to judge well in order to act well, and to judge as well as we can in order to do our best—that is to say, in order to acquire all the virtues and in general all the other goods we can acquire. And when we are certain of this, we cannot fail to be happy [*content*]. (*Descartes*, 125; *Oeuvres*, 144)

The best judgments are those which are indubitable. Indubitable judgments are those made in accord with the Cartesian method. Hence, contentment and virtue are assured by following the method and leaving behind considerations of the social order. Ostensibly, the social order will be transformed on the basis of "la plus parfaite morale'' which has defined virtue in terms of itself. Since the third maxim is pivotal, it seems that the first maxim (follow one's religion, the laws, and act the way the most moderate do) and the second (be resolute in action) are both to be interpreted in light of the contentment to be achieved through the application of the method. Thus, one ought to adhere resolutely to the method, and obey the law as long as the law does not conflict with the cultivation of one's reason. In the end, I take the first maxim to endorse unrestricted freedom moderated by adherence to the method. The adherent is not immoderately to limit freedom by the excess of promise. The contradiction between obeying the law and not limiting one's freedom by promise resolves if obeying the law is contingent upon the usefulness of the law to the Cartesian. Presumably, the Cartesian generally obeys the law because such obedience is most often a useful custom. As already discussed, however, Descartes refuses to subordinate himself to the social contract in its broad sense. The social contract is subordinated to the methodological cultivation of reason. The contradiction between the second maxim's demand for resolute action and the first maxim's last imperative (which demands the freedom to revise judgment continually) resolves in a similar way. Descartes is resolute as he pursues the methodological cultivation of his reason, but his judgments about the social order are continually revisable.

I see the revisability of Descartes' judgments about the social order to imply that the provisional morality cannot provide rules sufficient to guide everyday action which does not bear on the cultivation of reason. The recommendations of the parts of the first maxim which concern the everyday are themselves subject to revision according to what serves the cultivation of reason. Hence, Descartes' adherence to the law and norms of moderate conduct is subject to revision in accordance with the requirements of his inquiry. What is conventionally good and bad in the realm of action which does not bear on the cultivation of reason is completely revisable, for the Cartesian may at any time revise opinion and decide such action is good because it does serve the cultivation of reason, or bad because it does not. The provisional morality, however, cannot offer rules which determine which actions never conflict with the cultivation of reason and are always to be guided by religion, the laws, and the actions of the most moderate. Since Descartes cannot sufficiently predict the development of reason, the consequences of action in the social order, or the intersection of these two, the provisional morality cannot adequately specify the domain of action which does not bear on the cultivation of reason; hence, the morality cannot sufficiently determine whether or not an instance of action which ostensibly does not affect the cultivation of reason ought to be performed. If such an action is performed, it cannot be resolutely followed. In the end, the provisional morality can only *appear* to be sufficient to regulate these ordinary matters of action. The effort to see the coherence of the provisional morality requires the reader to recognize that it is insufficient to regulate everyday activity which ostensibly does not concern the cultivation of reason. If such an insufficiency is not to affect the Cartesian vision of living well, then apparently the reader must abandon the effort to take such ordinary action seriously. It seems that if such activity is considered in itself, then it must be judged to be beyond good and evil. In this way one avoids the troubles of regret and remorse. For the Cartesian, a judgment that an action is good or bad is a judgment that an action serves or does not serve the cultivation of reason. Hence, a judgment that an action does not bear on the cultivation of reason is a judgment that such an action is beyond good and evil. Thus, the provisional morality cannot be sufficient to ensure that the reader lives well, unless living well is Cartesian contentment.

In the end, however, the provisional morality is also insufficient to guide the Cartesian cultivation of reason. The provisional morality cannot articulate guidelines which are sufficient to determine whether or not an instance of conformity to the law (and the social contract in its broad sense) is compatible with the cultivation of reason. This problem is extant because the ethical questions of the social order cannot be subordinated to the methodological cultivation of reason. This problem is the Cartesian version of the problem residual to Plato's *Republic*; if the provisional morality were to suffice, Descartes would have to be a philosopher-king free to cultivate his reason. Descartes is dependent upon the cooperation of the larger human community; thus, he is not free from the ethical difficulties continually posed by the tension between his dependence on the social contract and his resolve to be free to cultivate his reason. The problem emerges in part six of the *Discourse* as Descartes addresses the question of whether or not he ought to publish; the reflection that he must bring to bear on his decision implies that the provisional morality is not a sufficient ground for the judgment required. Descartes' discussion of morality in part six seems to imply his awareness that the provisional morality ultimately fails to guide him, but here I reach the limits of my reading. It seems that if Descartes is to pursue resolutely the methodological cultivation of reason, then he must forget what limits its deployment. The contentment to be gained by adhering to the method seems to depend upon the dream that the social contract can be subordinated to the cultivation of reason. The absence of decisive argument for the morality in part six suggests that such a morality is needed to continue this dream, that it will not bear the wakefulness of careful reflection.

If the social contract cannot be subordinated to the cultivation of reason, then the provisional morality cannot be truly derived from the method. For the provisional morality is not a set of true and sound judgments about the way of life presupposed by the use of the method. If the provisional morality were a set of true and sound judgments, it would be a set of maxims sufficient to subordinate the social contract to the cultivation of reason. If this cannot be done, then the provisional morality cannot be derived from the method. Although Descartes seems aware that he cannot make completely transparent his derivation of the provisional morality, it is not clear to me how aware he is that such a derivation cannot be veridical.

If the provisional morality coheres, then the way of life presupposed by the use of the method dissolves into what is expedient for Descartes' cultivation of reason. Ultimately, this cultivation must be idiosyncratic. Descartes is careful to couch the provisional morality in terms of personal maxims; he is concerned with his own contentment in its coincidence with the development of his understanding. Ostensibly, Descartes must await the development of "la plus parfaite morale" before he speaks wisely on the basis of a science of morality. In the meantime, there is the self-justification of the provisional morality. Presumably, Descartes would urge those disturbed by such a morality to join him as he works toward his perfect morality. Yet the difficulties remain. Both derivation of the beginning and the wisdom of the perfect end escape grasp. The ground disappears as he urges the reader to sight a limb which remains unseen.[13]

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[13] I am grateful to Carl Page and Stephen Rowntree, S.J. for suggestions concerning earlier versions of this essay.

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CARTESIAN ETHICS : REASON AND THE PASSIONS

John Cottingham

INTRODUCTION.

One of the chief aspirations of philosophy as traditionally conceived was to help humans to lead happy and worthwhile lives. In the words of Descartes' scholastic predecessor Eustachius, *universae philosophiae finis est humana foelicitas* — the goal of a complete philosophical system is human happiness (1). Despite his radically new approach to philosophy, Descartes was determined to show that his system was no less fertile than those of his predecessors from the moral and felicific point of view. As he resoundingly declared in the preface to the French edition of the his magnum opus, the *Principles of Philosophy*, the construction of a perfect moral system — *la plus parfaite morale* — was to be the crowning aim of his philosophy. The metaphysical roots and the physical trunk were established; now he could turn to the practical branches, including morality, which would yield the fruit :

> [Par la morale] j'entends la plus haute et la plus parfaite morale, qui présupposant une entière conaissance des autres sciences, est le dernier degré de la sagesse. Or, comme ce n'est pas des racines ni du tronc des arbres qu'on cueille les fruits, mais seulement des extrémités de leurs branches, ainsi la principale utilité de la philosophie depend de celles de ses parties qu'on ne peut apprendre que les dernières (2).

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(1) EUSTACHIUS e SANCTO PAULO, *Summa philosophiae quadripartita* [1609], Preface to Part II.

(2) 'By "morals" I understand the highest and most perfect moral system, which presupposes a complete knowledge of the other sciences and is the ultimate level of wisdom.

© Revue Internationale de Philosophie 1/1996 - n° 195 - pp. 193-216.

But evocative though it may be, the arboreal metaphor leaves it very vague just how morality is supposed to relate to the rest of philosophy. As far as Descartes' own work is concerned, how exactly does the moral philosophizing of his later years connect up with the other parts of his system ? Does it, indeed, connect up at all, or should we dismiss as mere propaganda his talk of philosophy as an organically unified structure encompassing all aspects of human understanding, including the ethical ? In this paper I shall argue that there are indeed genuine and important links between Cartesian science and Cartesian ethics, and I shall indicate some of the ways in which Descartes' innovations in the former area produce a distinctive approach to the latter. In section one, I shall prepare the ground by uncovering some of the connections between scientific and ethical concerns which are to be seen even in Descartes' earlier writings. This will lead on to a brief account (in section two) of Descartes' theory of human nature, which will set the scene for a discussion (in section three) of Descartes' account of the relationship between reason and the passions. This oldest of topics in moral philosophy is at the centre of Descartes' later ethical writings, and the way he tackles it turns out to be the key for understanding why he considered his conclusions as a moral philosopher to be organically connected to his wider scientific and philosophical concerns.

1. Morality and the new method.

Nowadays Descartes is not widely regarded as a moral philosopher; indeed, in the anglophone philosophical tradition he is still often seen as first and foremost an 'epistemological' theorist, preoccupied with the conquest of scepticism and establishing the foun-

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Now just as it is not the roots or the trunk of a tree from which one gathers the fruit, but only the ends of the branches, so the principal benefit of philosophy depends on those parts of it which can only be learned last of all' (AT IXB 14-15 : CSM I 186). In this paper, 'AT' refers to the standard Franco-Latin edition of Descartes by C. Adam & P. Tannery, *Œuvres de Descartes*, (12 vols., revised edn., Paris : Vrin/CNRS, 1964-76); 'CSM' refers to the English translation by J. Cottingham, R. Stoothoff and D. Murdoch, *The Philosophical Writings of Descartes*, vols. I and II (Cambridge : Cambridge University Press, 1985), and 'CSMK' to Vol. III, The Correspondence, by the same translators plus A. Kenny (Cambridge University Press, 1991).

dations for reliable knowledge. This narrow view of Descartes' philosophical concerns — owing much to the specialised concerns of the our modern academic curriculum — cannot survive scrutiny of the voluminous writings on ethics and psychology which occupied Descartes' later years. But it turns out to be seriously misleading even with respect to his first published work, the *Discours de la Méthode* (1637) in which he announced his philosophical aims to the public.

A principal theme of the *Discourse on the Method* is the practical application of Descartes' scientific work: the famous purple passage in Part Six insists that the new science is not to be merely speculative, but is designed to yield real benefits for mankind (3). Yet the context in which morality first makes its appearance, in Part Three, appears at first to give it a merely peripheral or incidental importance: in order for metaphysics to proceed, it will be necessary to articulate a 'provisional moral code' designed to keep the meditator out of trouble while he withdraws from the world in order to establish foundations for the new science. The first of the four maxims which constitute the *code provisoire* is timidly conservative in tone: the author records his resolution to 'obey the laws and customs of my country, holding constantly to the religion in which by God's grace I had been instructed from my childhood, and governing myself in all other matters according to the most moderate and least extreme opinions — the opinions commonly accepted in practice by the most sensible of those I should have to live with' (4). The implied reluctance to enter the arena of public controversy certainly corresponds to an enduring element in Descartes' outlook. He aimed throughout his career to be 'a spectator rather than an actor in the comedy of life' (5), and seems to have been quite sincere when he later wrote to a correspondent who had asked about his 'views on morals' that he was reluctant to publish his opinions, since 'it is the proper function of sovereigns and those authorised by them, to concern themselves with regulating the behaviour of others (6). Descartes' moralising in this part of the *Discourse* seems purely instrumental: his aim is to foreclose the possibility of malicious attacks of his method of doubt by critics who might have presented the Cartesian 'truth rule' ('Accept only what cannot be doubted') as subversive of public order. Hence he proceeds, in the second rule of his 'provisional code', to make a clear distinction between intellectual judgement (where the suspension of belief is recommended wherever there is the mere possibility of doubt), and the sphere of ordinary practical life, where it is appropriate to follow prevailing opinion. In a letter written soon after the publication of the *Discourse,* Descartes showed himself sensitive to the criticism that 'universal doubt may produce great indecision and even moral chaos' (7); and he later commented in an interview that he had inserted the *code provisoire* in the *Discourse* specifically to avoid the charge that his new philosophy was such as to 'undermine religion and the faith' (8).

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(3) '[Ces notions générales touchant la physique] m'ont fait voir qu'il est possible à parvenir à des conaissances qui soient fort utiles à la vie, et qu'au lieu de cette philosophie spéculative, qu'on enseigne dans les écoles, on en peut trouver une pratique, par laquelle, connaissant la force et les actions du feu, de l'eau, des astres, des cieux et de tous les autres corps qui nos environnent, aussi distinctement que nous connaissons les divers métiers de nos artisans, nous les pourrions employer en même façon à tous les usages auxquels ils sont propres, et ainsi nous rendre comme maîtres et possesseurs de la nature' (*Discourse*, part vi, AT VI 62 : CSM I 142-3).

(4) *Discourse*, part iii, AT VI 23 : CSM I 122.

(5) AT VI 28 : CSM I 125. In an earlier letter to his friend Marin Mersenne, written soon after he had withdrawn his *Le Monde* from publication on hearing of the condemnation of Galileo, Descartes wrote ' I desire to live in peace and to continue the life I have begun under the motto *Bene vixit qui bene latuit* ['a good life is one which is lived to the end without attracting untoward attention'] (April 1634, AT I 286 : CSMK 43).

Despite this caution, Descartes allows us, when he reaches the penultimate maxim of his code, a glimpse of the wider ethical concerns that were to form an integral part of his eventual project of constructing a complete moral system. 'My third maxim was always to try to master myself rather than fortune, and to change my desires rather than the order of the world' (9). The scope of this third maxim with the remarks that follow it seems to go well beyond the need to devise a temporary set of rules for living while metaphysical speculation is in progress. Though still avoiding issues of public and social morality (where he was consistently reluctant to lay down the law) (10), Descartes now launches into the question of determining the conditions for individual happiness. The discussion takes us, in other words, to the central aspiration of philosophy as traditionally conceived, that of articulating a plan for the good life; and it becomes clear that Descartes wishes to make his own philosophy as enlightening in this respect as anything that the classical authors had to offer.

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(6) To Chanut, 20 November 1647, AT V 87 : CSMK 326.

(7) Letter of April or May 1638, AT II 35 : CSMK 97.

(8) 'The author does not like writing on ethics, but he was compelled to include these rules because of people like the schoolmen who would else have said that he was a man without any religion or faith and that he intended to use his method to subvert them' (*Conversation with Burman* [1648], AT V 178 : CSMK 352-3).

(9) AT VI 25 : CSM I 123.

(10) The nearest Descartes gets to discussing our duties in the public arena is in the

That Descartes sees himself as inheriting the traditional mantle of the moral philosopher is underlined both in the tone and the content of this part of the *Discourse*, where we find the argument couched in terms which would have been readily accessible to the thinkers of the ancient Hellenistic world. 'In general, I would [by following the third maxim] become accustomed to believing that nothing lies entirely within our power except our thoughts, so that after doing our best in dealing with things external to us, whatever we fail to achieve is absolutely impossible so far as we are concerned ... In this, I believe, lay the secret of those philosophers who in earlier times were able to escape from the dominion of fortune and, despite suffering and poverty, rival the gods in happiness' (11). The allusion here is unmistakably to the Stoics, who had diagnosed one of the root causes of unhappiness as a tension between the inner world of our aspirations and the outer world of external circumstances (12). To live well, on the Stoic account, is to live 'in accordance with nature'; and since the external world is, for the inhabitants of the classical age, largely something unalterable which one has to accept as it is, the Stoics reasoned that fulfilment must consist in a state of inner detachment and acceptance of what cannot be changed. Descartes returned to discuss this ancient theme in his correspondence with Princess Elizabeth

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letter to Elizabeth of 15 September 1645 — though even here the starting point is that 'each of us is a person distinct from others whose interests are accordingly in some way different from those of the rest of the world' (AT IV 293 : CSMK 266).

(11) *Discourse*, part iii, AT VI 25-6 : CSM I 124.

(12) The sixteenth century had seen a powerful renaissance of Stoic thought. L. Zarka, who provides a thorough account of some of the key figures in this movement, points out that though certain elements in Stoic ethics chimed in well with Christian doctrine, the neo-Stoic movement could nevertheless be seen as potentially subversive of religious faith : 'le stoicisme, avec son culte exclusif de la raison, ouvrait la porte à la morale laïque, à la religion naturelle ... Le néo-stoïcisme est en définitive un rationalisme chrétien, dans lequel le christianisme n'apparaît pas toujours comme essentiel, mais plutôt comme surajourté' (*La renaissance du stoïcisme au XVIe siècle*, (Paris : Champion, 1914), pp. 334, 337).

of Bohemia in the mid sixteen-forties, when he proposed as a text for discussion the *De vita beata* ('The Blessed Life') of the celebrated Roman Stoic, Lucius Seneca. Expounding Seneca's ideas to the Princess, Descartes commented that 'the things which can give us supreme contentment can be divided into two classes: those which depend on us, like virtue and wisdom, and those which do not, like honours and riches.' Everyone can 'make himself content without any external circumstance' provided he bears in mind that 'all the good things one does not possess are equally outside one's power, and hence becomes accustomed not to desire them' ([13]).

The initial impression which emerges from some of these texts might suggest that Cartesian ethics consists merely in a kind of Stoic addendum which Descartes tacked on as an afterthought to the main body of his philosophy ([14]). But to take seriously Descartes' insistence that his philosophy is a unified system requires us to dig deeper. If the 'perfect moral system' envisaged by Descartes is, as he claims, an organic outgrowth from the new physics, then its structure can be expected to differ in crucial respects from that of ethical systems which rested on wholly different foundations. That this is indeed so begins to come out in the fourth and final maxim of Descartes' *code provisoire*, where he touches on the question of which occupation is the most worthy of choice, and resolves 'devote the whole of [his] life to the cultivation of reason' ([15]). For the Stoics, the exercise of reason is the key to living in accordance with nature, and the calm acceptance of our place in the cosmos is one of the signal fruits of properly conducted philosophy ([16]). But for Descartes, the right use of

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(13) Letter of 4 August 1645, AT IV 265: CSMK 257-8. There are other provisos in the letter, notably the requirement that we 'maintain a firm and constant resolution to carry out whatever reason recommends'; this corresponds to what will become a central emphasis in Cartesian ethics, its stress on the power of the will. I discuss the implications of this in my 'Partiality and the Virtues', in R. Crisp (ed.), *How Should One Live ?* (Oxford: Oxford University Press, 1996, pp. 57-76).

(14) Though (as we shall see later on) Descartes is by no means always sympathetic to the Stoics; see further J. Cottingham, *A Descartes Dictionary*, (Oxford: Blackwell, 1993) s. v. 'passions', and the introduction by G. Rodis-Lewis to Descartes' *Passions of the Soul*, trans. Stephen Voss (Indianapolis: Hackett, 1989).

(15) AT VI 27: CSM I 124.

(16) 'The world soul is rational or intelligent through and through [and] this doctrine provides the physical foundation for the ethical injunction that human beings, as parts of the whole, should conform themselves to universal nature by perfecting their rationality.'

reason is intimately linked with his new method for 'reaching the truth in the sciences' — a connection explicitly made in the very title of the *Discourse* ([17]). The projected results of this method go far beyond the passive and accepting contemplation of an unalterable providential order of nature.

In the first place physical nature is, in Descartes' conception, crucially different from the accessible pattern of providential design which had impressed the Stoics: Cartesian science reveals the world as an austere configuration of mechanical particle interactions, whose essential structure man confronts as something *alien* to his own nature as a thinking being ([18]). And in the second place, the new scientific understanding of that mechanical universe is of a kind which promises far more than mere submissive acceptance. The list of the fruits of the new science which Descartes himself sketches out in the later sections of the *Discourse* opens the door to the possibility of wide-ranging technical manipulation and control: armed with Cartesian physics, man can learn how to produce new compounds (such as glass) ([19]); how to understand the physiological processes in the human body such as the circulation of the blood ([20]); how to use the results of this knowledge in the development of a new medical science capable of 'freeing us from innumerable diseases and perhaps even from the infirmity of old age' ([21]); how, in short, to develop a systematic experimental technology enabling us to become 'lords and masters of nature' ([22]). Descartes, no less than his Stoic predecessors, has a 'synoptic' conception of philosophy in which the recipe for the good life is integrally linked to an underlying cosmology, a theory of knowledge, and a characteristic vision of mankind's place in the

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See A. A. Long and D. N. SEDLEY, *The Hellenistic Philosophers* (Cambridge: Cambridge University Press, 1987) p 319. Cf. Diogenes Laertius, 7, 87-9.

(17) *Discours de la méthode pour bien conduire sa raison et chercher la vérité dans les sciences* ('Discourse on the method needed for the good conduct of reason and for reaching the truth in the sciences'; AT VI 1 : CSM I 111).

(18) See J. COTTINGHAM, 'The self and the body: alienation and integration in Cartesian Ethics', *Seventeenth-century French Studies*, 1995, pp. 1-130.

(19) Part v, AT VI 44-5 : CSM I 133.

(20) Part v, AT VI 47ff : CSM I 134ff.

(21) Part vi, AT VI 62 : CSM I 143.

(22) *Ibid.* See note 3, above. For the experimental emphasis in Descartes' scientific methodology, see AT VI 64-5 : CSM I 144, and J. COTTINGHAM, *A Descartes Dictionary*, s. v. 'experience'.

world; but precisely because all the ingredients are now worked out differently, the resulting conception of how we should live turns out to be crucially different.

This is not to deny that Descartes has in common with the Stoics the objective of leading a contented life; and in common with them, he will advocate calm acceptance of what cannot be altered. But precisely because his new conception of science is progress-driven (the word 'progress makes a conspicuous appearance in the very first sentence of the *Discourse*) (23), the extension class of what can be altered has undergone a momentous and irreversible expansion. It may be true that it is 'only our thoughts are '*entirely* within our power' (24), but nevertheless the indirect power humans can now aspire to have over the mechanical world and the mechanisms of the body is vastly increased. And the effects of this expansion make themselves felt not just in the areas of physics and physiology, but in the very subject matter of ethics itself. Like the Stoics, Descartes addresses the age old task of helping mankind to live a rationally ordered life, and to come to terms with the often problematic relation between reason and the passions. But he will now bring to bear on that project a different analysis of the nature of mankind, a different notion of the role of the body in that nature, and a different account of the structure of the passions, and how they can be controlled.

2. HUMAN NATURE.

Notwithstanding his scientific programme for control of the environment and of the machine of the body, and despite his official dualistic metaphysics, Descartes became increasing preoccupied, when he came to develop the details of his ethical system, with the need for a genuine 'anthropology' — one which would do justice to the inescapable fact that we are not *merely* incorporeal minds inhabiting an alien mechanism, but creatures whose welfare is, in a special and intimate way, bound up with the operations of the body, and with the feelings, sensations and passions that arise from our embodied state. The subject matter of Cartesian ethics becomes inescapably embroiled with what came to be the major task of Descartes' closing years, the task of coming to terms with — and trying to mitigate the harsher effects of — that alienation of man from nature which his own dualistic metaphysics and mechanistic science had threatened to generate.

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(23) The opening synopsis announces Descartes' aim of '*making further progress* in the investigation of nature than has hitherto been achieved' (*aller plus avant* en la recherche de la nature qu'il n'y a été). (Emphasis supplied).

(24) Il n'y a rien qui soit *entièrement* en notre pouvoir que nos pensées (AT VI 25 : CSM I 123. Emphasis supplied).

The starting point for this project is Descartes' frequent insistence on the *special status* of human beings. Writing to Regius in 1642, Descartes observed :

> Si angelus corpori humano inesset, non sentiret ut nos, sed tantum perciperet motus qui causarentur ab objectis externis, & per hoc a vero homine distingueretur. (If an angel were in a human body, it would not have sensations as we do, but would simply perceive the motions which are caused by external objects, and in this way would differ from a real human being.) (25)

A genuine human (*verus homo*) : the phrase is a striking one, and it echoes the earlier French phrase which Descartes had employed in the *Discourse* several years earlier. To make a real human being, more is needed than the 'lodging' of a soul in the machine of the body : il est besoin qu'elle soit jointe et unie plus étroitement avec lui pour avoir … des sentiments et des appétits semblables aux nôtres, et ainsi composer *un vrai homme* (26). A human is no mere soul making use of a body, no mere pilot lodged in the corporeal ship, but a genuine entity in its own right. It is an entity, moreover, with properties (sensory states, emotions and passions) which are not reducible either to modes of extension, or to pure modes of thought (27).

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(25) Letter to Regius, January 1642 (AT III 493 : CSMK 206).

(26) 'Next [after describing the machine of the body] I described the rational soul, and showed that, unlike the other things of which I had spoken, it cannot be derived in any way from the potentiality of matter, but must be specially created. And I showed how it is not sufficient for it to be lodged in the human body like a helmsman in his ship, except perhaps to move its limbs, but that it must be more closely joined and united with the body in order to have, besides this power of movement, feelings and appetites like ours, and so to constitute *a real human being*' (*Discourse*, part v, AT VI 59 : CSM I 141 (emphasis supplied)). Descartes is here referring back to his earlier work in the *Traité de l'homme*.

(27) For more on this irreducibility, see J. COTTINGHAM, *Descartes* (Oxford : Blackwell, 1986), Ch. 5.

The special nature of human beings has obvious and immediate implications for ethics. Previous ethical systems developed by the Greeks tended to take on a 'ratiocentric' bias, which led to problems about applying a rationally devised life-plan to the awkwardly recalcitrant realm of human feeling and emotion (28). The Cartesian model for science seems at first to be even more ratiocentric, viewing the world as an abstract, mathematically ordered system of 'extended matter in motion', and construing the human contemplators of that system as pure thinking things, detached from the world of extension, and alienated even from the physical mechanisms of their own bodies. But Descartes' attempt to develop a distinctive 'anthropology' puts all this in a rather different focus. Although the deliverances of reason reveal a rigidly dualistic world of extended matter plus incorporeal consciousness, our own daily experience as human beings provides a very different kind of awareness — one coloured by intimate and urgent feeling and emotion, one which projects us into the very centre of a 'substantial union' of mind and body, where, so far from operating as cognitive pilots of an alien bodily machine, each of us finds the operations of the body that is in a special and intimate sense his *own* giving rise to a rich and vivid sensory and emotional life. This is not to say that the Cartesian doctrine of man as 'substantial union' is free from problems; as Descartes himself had to admit, the way in which soul is united to body was beyond the power of philosophical reason to explicate fully, and has to be grasped on the level of our inner experience (29). But what does emerge is a new account of the subject matter of ethics. The 'most perfect moral system' which Descartes envisaged as the crown of his philosophical enterprise would, to be sure, presuppose a fully developed physics of matter in motion, an understanding of the mechanical operations of extended matter. And it would also require an understanding that our own nature as thinking beings is distinct from, and irreducible to, the operations of the material world. The picture so far is of a predatory Cartesian ego, manipulating the alien material environment to its own purposes. But for all that, ethics will have its own distinct subject matter — a subject matter which is irreducible in the sense that it cannot be fully understood either in terms of the mathematical descriptions of physics, or of the purely intellectual and volitional operations of the mind. To understand what makes us most fully and distinctively human, we need to go beyond the categories of thought and extension, and focus on the affective dimension of which we are vividly and immediately aware in our daily experience as creatures of flesh and blood.

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(28) The problems have their origins in Plato, but pervade the ethical thinking of many later writers, notably the Stoics. Compare Stobaeus, 2.88 : 'Every passion is overpowering, since people in states of passion, though they frequently see that it is not suitable to do something, are carried away by the intensity, as though by a disobedient horse, and induced to do it ... In states of passion, even if people realize ... that one should not feel distress, or fear or be in any state of passion, they still do not give these up, but are brought into a position of being controlled by their tyranny' (cited in Long and Sedley, *op. cit.*, 65A.)

(29) 'What belongs to the union of the soul and the body is known only obscurely by the intellect ... but it is know very clearly by the senses ... Metaphysical thoughts, which exercise the pure intellect, help to familiarise us with the notion of the soul; the study of mathematics ... accustoms us to form very distinct notions of body. But it is the ordinary course of life and conversation, and abstention from meditation ... that teaches us how to conceive the union of the soul and body' (Letter to Elizabeth of 28 June 1643, AT III 691-2 : CSMK 227).

In his last work, *Les passions de l'âme,* Descartes wrote that 'those whom the passions can move most deeply are capable of enjoying the sweetest pleasures of this life' ([30]). The work is largely concerned with a detailed examination of the physiological basis for the occurrence of human emotions. But Descartes also insists on the subjective dimension — the way in which the passions affect the conscious subject who, as he had earlier put it, is 'not merely lodged in the body but closely intermingled with it' ([31]). Descartes saw the passions as crucial for the ethical quality of our lives. And what matters from the ethical point of view is not just the physiological events (vital though these are for understanding how we work), but the way in which such events are presented to consciousness as fear, hope, anxiety, confidence, despair, jealousy, pity, anger, pride, shame, cheerfulness and love. Here Descartes offers the hope that by careful training, and the resolute exercise of our will, we can become not the slaves but the masters of our biological inheritance: 'ceux même qui ont les plus faibles âmes pourraient acquérir un empire très absolu sur toutes leurs passions, si on employait assez d'industrie à les dressser et les

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(30) *Passions of the Soul*, art. 212 (AT XI 488 : CSM I 404).

(31) Sixth Meditation, AT VII 81 : CSM II 56.

conduire' (³²). But the result of this will be not a life not of confined and curtailed passions, but of passions properly channelled, a life where humans can experience emotional richness and joy : 'la philosophie que je cultive n'est pas si barbare ni si farouche qu'elle rejette l'usage des passions; au contraire, c'est en lui seul que je mets toute la douceur et la félicité de cette vie' (³³).

Descartes clearly saw that a complete philosophical system must find space for the affective dimension of our existence, for the significance of sensation, emotion and feeling in the way in which we understand ourselves, and conduct our lives. The 'perfect moral system', in short, would be an organic outgrowth from Descartes' 'anthropology' (³⁴), and would rest on the fullest possible understanding of the workings of the passions in human life.

3. THE ROLE OF THE PASSIONS.

The conclusions of the previous section have underlined the special status of human beings, and the correspondingly special subject matter of ethics. But it might be supposed that this very specialness isolates Descartes' ethics from the rest of the Cartesian system, rather than integrating into the organically unified structure of his philosophy. How is such an integration possible ?

Descartes wrote to a correspondent in 1646 that his results in physics had been 'a great help in establishing sure foundations in moral philosophy' (³⁵); and when he finally published his treatise on the passions he distinguished his approach from that of many of his

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(32) Passions of the Soul, art. 50 (AT XI 370 : CSM I 348).

(33) 'The philosophy I cultivate is not so savage or grim as to outlaw the operation of the passions; on the contrary, it is here, in my view, that the entire sweetness and joy of life is to be found' (letter to ? Silhon, March or April 1648 : AT V 135).

(34) Descartes' work on the passions is aptly described by Geneviève Rodis-Lewis as 'a ground-breaking study concerning a modality specific to the union between soul and body.' (Introduction to S. Voss (ed.), *Descartes : The Passions of the Soul*, p. xv.) Many of the issues raised in the present paper are brilliantly illuminated by Rodis-Lewis in her *L'anthropologie cartésienne* (Paris : Presses Universitaires de France, 1990), Introduction and Chapter 1.

(35) '... la notion telle quelle de la Physique, que j'ai tâché d'acquérir, m'a grandement servi pour établir des fondements certains en la Morale' (to Chanut, 15 June 1646, AT IV 441 : CSMK 289).

predecessors by stressing his goal of explaining the passions *en physicien* — from the point of view of a physical scientist (36). The etymology of the term 'passion' (derived from the Latin verb for 'to suffer') (37), suggests something contrasted with an action — something that *happens* to a person, as opposed to that which he initiates. Hence Descartes observes that in the broadest sense anything which is not an active volition of the soul may be called a passion; but he reserves the term in its more restricted sense for those mental happenings which are the result of the soul's *union with the body*: 'those perceptions, sensations or emotions of the soul which ... are caused, maintained and strengthened by some movement of the [animal] spirits' (38). The passions, for Descartes, are but one group of phenomena whose operation depends on the transmission of neural impulses. According to Descartes, what we are aware of as sensations (such as those of heat or cold), feelings (such as those of hunger and thirst), and emotions or passions (like joy and sadness) are all caused, on the material level, by various physiological disturbances (for example in the heart, the blood, and the surface of the skin); these disturbances excite movements of the 'animal spirits' which are in turn transmitted, via the nervous system, to the brain (39).

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(36) AT XI 326: CSM I 327. The idea that the passions involve both physiological and psychological aspects was an ancient one, going back to Aristotle. The sixteenth-century Coimbrian commentators on Aristotle had classified the passions as 'affects of the soul in common with the body' (affectus communes animae cum corpore): *Commentarii de anima*, I, 1, cited in E. GILSON, *Index Scolastico-Cartésien* (Paris: Alcan, 1913; 2nd edn., Paris: Vrin, 1979), no 322. The scholastic philosopher Eustachius, Descartes' near-contemporary whom he had studied as a schoolboy, defines a passion as 'a movement of the sensitive appetite arising from the apprehension of some good or evil, accompanied with some unnatural bodily change' — 'unnatural' here denoting an abnormal or excessive physiological response, such as increased heart-rate (Eustachius, *Summa philosophiae*, II, 100-1, cited in Gilson, *Index*, no. 321). It is, of course, a matter of common sense observation and personal experience that many emotions are accompanied by physiological changes (for example, embarrassment by flushing). Descartes, however, will bring the details of his mechanistic physiology to bear on a new account of how the passions may be controlled and modified.

(37) Descartes' use of the French *passion* corresponds to the standard scholastic Latin term *passio*, (from the verb patior, to suffer), which in turn corresponds to Aristotle's term πάθος, similarly derived from the ordinary Greek verb for to suffer. For standard definitions of the term in scholastic philosophy, see preceding note.

(38) *Passions of the Soul*, art. 27 (AT XI 349: CSM I 339).

(39) Compare the list in the *Principles of Philosophy*, Part I, art. 48. Descartes distinguishes the passions from other kinds of sensory and appetitive states by the fact that the

What mediates the resulting brain events and the ensuing awareness in the soul is the tiny gland in the centre of the brain which, notoriously, Descartes identified as the 'principal seat of the soul' ([40]). It is here that the minute fluctuations in the animal spirits produce a distinctive pattern of movement which causes the soul to have a particular mode of sensory or emotional awareness (and conversely, it is in the gland that the volitions of the soul are translated into movements that subsequently generate, via the nerves, appropriate muscle contractions for the performance of bodily movements like walking or speaking) ([41]). The positing of a kind of cerebral 'fax machine to the soul' (in Daniel Dennett's scathing phrase) ([42]) has not impressed subsequent critics; those exercised with the problem of psychophysical causation (how an immaterial soul can be stimulated by, and cause movements in, the machine of the body) are hardly likely to have their worries allayed by being told that the soul interacts, not with the body as a whole, but with a particular gland in the brain. But it is important not to be sidetracked by Descartes' bizarre choice of a specific organ to be the 'seat of the soul'. For all its awkwardness, Descartes theory does succeed in pointing up a crucial feature about the nature of human emotional and sensory awareness, namely that the various modes of such awareness are intimately linked with physiologically determined processes of which in our ordinary lives we are, for the most part, quite ignorant. This central point is quite independent of the truth or falsity of Descartes' official dualistic theory of an incorporeal mind. And it is also unaffected by the fine detail of the physiological story involved: Descartes's 'pneumatic' theory of the nervous system supposes the brain is stimulated by the rapid movements of a fine gas along the hollow pipes of the nerves; nowadays, we have at our disposal a vastly more sophisticated electro-chemical explanatory apparatus. But in our ordinary lives, unless we are neuroanatomists or biochemists, we are more or less ignorant of what is

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passions are 'referred to the soul', while other items in the list (such as 'smells, sounds and colours') are 'referred to external objects', and others again (such as 'hunger, thirst and pain') are 'referred to our own body' (*Passions*, art. 29).

(40) *Passions*, art. 32. See J. COTTINGHAM, *A Descartes Dictionary*, s. v. 'pineal gland'.

(41) Cf. *Traite de l'homme*, AT XI 176f: CSM I 106f.; *La dioptrique*, AT VI 141f: CSM I 172f.

(42) Cf. D. DENNETT, *Consciousness Explained* (Harmondsworth: Allen Lane, 1992).

going on at this level. And even if we do happen to know about it, such knowledge plays no role in the immediate and direct awareness we generally have of our sensory and emotional states. What is crucial for ethics, however, and it is this which Descartes is about to explore with illuminating effect, is that the operation and functioning of those affective modes (such as joy, excitement, and distress), despite the direct awareness we have of them, is nonetheless not under direct conscious control. For the causal genesis of those states, at the physiological level, is largely opaque to the conscious subject.

It is here that Cartesian anthropology, Descartes' insistence on our essentially embodied nature as human beings, yields a rich harvest. The traditional project of Greek ethics involved the goal of achieving the kind of rational mastery, or at least guidance, of the emotions and passions which would enable humans to lead a good and fulfilling life. And Descartes subscribes to this ancient aspiration : herein, he declares, lies the 'chief use' of philosophical wisdom (43). But because of our embodied nature we cannot, by the mere exercise of our will, generate the desired patterns of emotional response, since we cannot directly control the relevant physiological changes in our bodies — any more than we can directly control any other events in the physical universe. The natural (or divinely ordained) (44) correlations between physiological events and psychological states are not within our power to set up from scratch; they were laid down, as part of our human nature, long before we came on the scene, so to speak — long before we emerged, either evolutionarily, as a species, or in our individual journey to adult life, as thinking beings (45). But although human beings are not self-creating, although they are, as it were, 'lumbered' with genetically and environmentally laid down patterns of psycho-physical response, they are nonetheless in the unique position of being able to investigate, reflect on, and to a considerable extent modify, the relevant responses. It is here that Descartes makes a crucial contribution to the age-old debate over the relation between reason and the passions, by pioneering what we now know as the theory of the conditioned response.

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(43) *Passions*, art. 212.

(44) The two notions come down to the same thing for Descartes; cf. Sixth Meditation (AT VII 88 : CSM II 60-1).

(45) The term 'evolution' is not entirely anachronistic when applied to Descartes, since he clearly subscribes to a gradualist view of the origins of the universe, and of living things (cf. *Le Monde*, AT XI 34 : CSM I 91). However, Descartes' account of the human species invokes a special creative act whereby the creator implants a rational soul in the body (cf. *Discourse*, part v, AT VI 59 : CSM I 141). But the significance of the fact that we are 'lumbered' with pre-determined patterns of psychophysical response is unaffected by the question of whether those patterns evolved over time, or were specially ordained by God.

Descartes' starting point is that even animals, who lack rational awareness, can be trained in such a way as to modify pre-existing patterns of physiological and behavioural response. As early as 1630 he had reflected on the possibility that 'if you whipped a dog five or six times to the sound of a violin, it would begin to howl and run away as soon as it heard that music again' (46). A more detailed canine example is given in the *Passions* :

> When a dog sees a partridge it is naturally disposed to run towards it; and when it hears a gun fired, the noise naturally impels it to run away. Nevertheless, setters are commonly trained so that the sight of partridge makes them stop, and the noise they hear afterwards, when someone fires at the bird, makes then run towards it. These things are worth noting in order to encourage each of us to make a point of controlling our passions. For since we are able, with a little effort, to change the movements of the brain in animals devoid of reason, it is evident that we can do so still more effectively in the case of human beings. Even those who have the weakest souls could acquire absolute mastery over all their passions, if we employed sufficient ingenuity in training and guiding them (47).

In adapting the example of animal training to the human sphere, Descartes retains the central idea of the conditioned response as the key to how the innately predetermined mechanisms of the body can be modified to our advantage. The idea that the good life requires training and habituation had, of course, been explored by Aristotle : virtue depends, in the Aristotelian account, on our having acquired the right habits of feeling and action, on our possession not just of 'right reason', but of the appropriate kinds of ingrained dispositions to feel and behave in the right ways (48). What Descartes now adds to this story is the perspective of the behavioural and physiological scientist who is able to investigate the physical causes of our emotional patterns of response, and in time learn to manipulate and 'reprogam' them.

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(46) To Mersenne, 18 March 1630 (AT I 134 : CSMK 20). Descartes' reflections in this regard were partly stimulated by the writings of some of his renaissance predecessors. In article 127 of the *Passions* he refers to the work of the sixteenth-century scholar Juan Luis Vives, who had cited an example of a morbid condition in which laughter was aroused by certain foods.

(47) *Passions*, art. 50.

A memorable example which Descartes provides from his own personal experience has direct implications for ethics :

> The objects which strike our senses by mean of the nerves move certain parts of our brain and there make certain folds … [and] the place where the folds were made has a tendency to be folded again in the same manner by another object resembling even incompletely the original. When I was a child, I loved a girl of my own age who had a slight squint (une fille de mon âge qui était un peu louche). The impression made by sight in my brain when I looked at her cross-eyes became so closely connected to the simultaneous impression which aroused in me the passion of love that for a long time afterwards when I saw persons with a squint I felt a special inclination to love them simply because they had that defect; yet I had no idea myself that this was why it was. However, as soon as I reflected on it, and recognized that it was a defect, I ceased to be affected by it. So when we are inclined to love someone without knowing the reason, we may believe that this is because they have some similarity to something in an earlier object of our love, though we may not be able to identify it (49).

There are two points of immediate importance here. The first is the notion of a physiological genesis for the passions : as a result of sensory stimulation, a 'fold' (or neural pathway, as we might now say) is set up in the brain which predisposes us to react in similar ways to future stimuli of a like kind. Second, there is the idea that an investigation the circumstances of the original stimulus, (backed up by an informed physiological theory) can enable us to 'stand back', as it were, from the causal nexus (in a way animals are unable to do), and consider the possibility of modifying our future responses.

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(48) *Nicomachean Ethics*, Book II.

(49) Letter to Chanut of 6 June 1647 (AT V 57 : CSMK 323). For the notion of 'folds in the brain' (a kind of crude mechanical anticipation of the modern notion of neural pathways) see *Conversation with Burman*, AT V 150 : CSMK 336.

But there is a third, underlying, insight which has special significance for the role of the passions in the good life. Traditional 'logocentric' models had assumed a kind of transparency about the operation of the passions : we are aware of what we ought rationally to do, and we are also aware of emotions which often pull us in the opposite direction. Ethically correct conduct consists, on this model, in devising some way to bring the passions into line with reason, but we are offered precious little guidance as to how this desired outcome is to be achieved; more striking still, on the traditional model, it is something of a mystery that the 'greater good', once perceived by reason is not automatically chosen. This left the classical moral philosophers signally ill-equipped to understand the phenomenon of weakness or *akrasia* — the plain fact that, as a result of the passions, human beings often just fail to select what is clearly perceived as the better of two options. To tackle this problem, Descartes now offers a strikingly original insight : *the causal genesis and subsequent occurrence of the passions is intimately linked to corporeal events in ways which often make the force of the resultant emotion opaque to reason.* What so often threatens to overwhelm us when we are in the grip of a potentially damaging passion is precisely the fact that something is happening to us whose basis, in our physiological makeup, and our past psychological history, we only dimly, if at all, understand. And realizing this in turn offers for the first time the hope that humans may be able to achieve successful 'management' of the passions. 'As soon as I reflected on [the causes]', says Descartes about his infatuation with cross-eyed women, 'I ceased to be affected by it.' Here there emerges the idea of a genuine 'therapy' for the passions which offers a completely new route from the old Stoic and Epicurean ideas of suppression and avoidance, on the one hand, or the purely cognitive exercise of eliminating false beliefs on the other ([50]). Examining the passions *en physicien*, from the point of view of a natural scientist, reveals the full extent to which their influence depends on factors below the threshold of consciousness. We now have a striking paradox : Descartes, the very thinker who is so often accused of having a

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(50) For a more 'therapeutic' view of the Epicurean approach, see Martha NUSSBAUM, 'Words Not Arms', in her edited collection *The Poetics of Therapy* (Edmonton : Academic Publishing, 1990).

naive theory of the perfect *transparency* of the mind (51), is actually telling us that our emotional life as embodied creatures, as human beings, is subject to a serious and pervasive *opacity*. A proper understanding of our human nature involves recognition of the extent to which we are not just angelic minds inhabiting bodily mechanisms, but creatures whose deepest and strongest feelings are intimately tied up with structures and events which are concealed from us as 'thinking beings'. Coming to terms with the essential opacity to the conscious mind of the operation of the passions now becomes the chief task of what might be called Descartes' 'anthropologically informed' ethics.

In what is, in some respects at least, a striking anticipation of the Freudian line, Descartes links his new approach to the passions with an analysis of the way in which the structure of our emotional lives is influenced by the forgotten events and pre-rational experiences of early childhood. In 1647, Queen Christina of Sweden, with blandly regal authority, had commanded the French resident in Stockholm to obtain Descartes' answer to the momentous question 'What is love?' (52). In his reply, Descartes made an important distinction between 'purely intellectual or rational love' and 'the love which is a passion'. The former consists simply in the calm volition of the soul to 'join itself' to some rationally perceived good. This is the kind of love, presumably, that a pure intellectual being such as an angel might enjoy, and which human beings experience when they pursue, rationally and without disturbance, those goods which their reason adjudges worthy to be obtained. But things are very different when, as so often happens, we desire something in an emotionally charged way, when, as we say, we feel 'churned up' about someone or something. What complicates the picture here is, on the physiological level, the powerful patterns of bodily response which have been laid down in the past, and, on the psychological level, the compelling, though often obscure and confused, emotions which we experience without fully understanding their causes. In such cases, 'the rational thoughts involved are accompanied by the confused feelings of our childhood which remain joined to them'. A full explanation of the passions, in short, involves a detailed examination of the history of our early lives, going right back, says Descartes, to 'when we first came into the world'; 'it is this which makes the nature of love hard for us to understand' (53).

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(51) It is fairly common, for example, for commentators on the Freudian notion of the unconscious mind to say that Freud broke from the *Cartesian* thesis that mentality and consciousness are equivalent; cf. S. GARDNER, *Irrationality and the philosophy of psychoanalysis* (Cambridge: Cambridge University Press, 1993), p. 207. Margaret Wilson in her *Descartes* (London: Routledge, 1978) attributes to Descartes 'the doctrine of epistemological transparency of thought or mind' (p. 50), though she does go on to discuss certain aspects of Descartes' philosophy of mind which are in potential conflict with that doctrine (cf. p. 164).

(52) The resident was one of Descartes' important correspondents in his later years, Hector-Pierre Chanut (later to become French ambassador to Sweden).

Descartes' theory of the passions thus offers us the hope that by an informed understanding of their psycho-physiological causes we may be able to lead enriched lives, free from the feeling that we are dominated by forces outside our control. It might seem at first that this would lead his ethics back in a broadly Platonic or Stoic direction, towards the thought that the source of our human problems is an essentially cognitive one, and that a purified understanding would leave us free to pursue the goods which are revealed by reason to be most worthy of attainment. There are certainly places where Descartes appears attracted by the Platonic idea that all weakness is due to ignorance. In the *Discourse on the Method* he remarks that 'to act well it is sufficient to judge well' (*il suffit de bien juger pour bien faire*); defending this claim to a correspondent he quotes with apparent approval the maxim *omnis peccans est ignorans* ('whoever sins does so in ignorance'), an echo of the Platonic doctrine that no one intentionally chooses the lesser good (54). An intellectualist approach to the ethics of reason and the passions is perhaps most prominent in a letter to Elizabeth written in 1645 :

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(53) By the phrase 'when we first came into the world, Descartes has in mind the soul's first union with the body; hence he traces the causes of the passions back even prior to birth, to the experiences undergone inside the womb : '... d'autant que l'amour n'était causée, avant la naissance, que par un aliment convenable qui, entrant abondamment dans le foie, dans le coeur et dans le poumon, y excitait plus de chaleur que de coutume, de là vient que maintenant cette chaleur accompagne toujours l'amour'. The general moral is articulated later in the letter : 'Ce sont ces sentiments confus de notre enfance, qui, demeurant jointes avec les pensées raisonnables par lesquelles nous aimons ce que nous en jugeons digne, sont cause que la nature de l'amour nous est difficile à connaître.' (letter to Chanut of 1 February 1647, AT IV 606 : CSMK 308)

(54) Cf. *Protagoras* 345e1. In the *Conversation with Burman* (AT V 159 : CSMK 342), Descartes is reported as asserting that 'no one can pursue evil qua evil', a direct echo of Plato's claim οὔδεις βούλεται τα`κακά (*Meno*, 78b1).

> Often passion makes us believe certain things to be much better and more desirable than they are; then, when we have taken much trouble to acquire them, and in the process lost the chance of possessing other more genuine goods, possession of them brings home to us their defects; and thence arise dissatisfaction, regret and remorse. And so the true function of reason is to examine the just value of all the goods whose acquisition seems to depend in some way on our conduct, so that we never fail to devote all our efforts to trying to secure those which are in fact the more desirable (55).

But although Descartes clearly shares with Plato and the Stoics a firm belief in the importance of an informed rational evaluation of the options open to us, he nonetheless goes on to resist the kind of austere intellectualism which rejects the operation of the passions as harmful to the good life. The Stoic ideal of *apatheia*, the transcendence of the normal human passions, is one which he had implicitly condemned as early as the *Discourse* : the supposed virtues of the Stoic heroes, Cato and Brutus, are in his eyes, examples of insensitivity, pride and despair (56). Taking up the theme with a correspondent ten years later, he insisted not only that the passions were not to be suppressed, but also that some of them were a positive good, indeed the sole source of our greatest human joys (57).

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(55) Letter of 1 September 1645 (AT IV 284-5 : CSMK 264). Descartes goes on to say that the passions often 'represent the goods to which they tend with greater splendour than they deserve and they make us imagine pleasure to be much greater before we possess them than our subsequent experiences show them to be.' The letter concludes with the observation that 'the true function of reason in the conduct of life is to examine and consider without passion the value of all the perfections, both of the body and of the soul, which can be acquired by our conduct, so that since we are commonly obliged to deprive ourselves of some good in order to acquire others, we shall always choose the better.'

(56) AT VI 8 : CSM I 114. See further the comments by G. RODIS-LEWIS in S. VOSS (ed.) *Descartes, Passions of the Soul*, p. xvi, and in J. COTTINGHAM (ed.), *The Cambridge Companion to Descartes* (Cambridge : Cambridge University Press, 1992), p. 27f. Compare the following analysis by ZARKA : 'Du stoïcisme, [Descartes] n'accepte point la théorie fondamentale de l'apathe, c'est-à-dire la surpression complète de toute passion. La passion, pour Descartes, participe de l'optimisme stoïcien; elle est par conséquent bonne, elle n'est nuisible que dans ses excès. Elle est bonne si l'on sait en faire un bon usage, c'est-à-dire, si la volonté sait s'en servir, et c'est alors que nous retrouvons le stoïcien. Descartes, lui aussi, ne voit dans l'âme que'entendement et volonté; il sacrifie la sensibilité (*La renaissance du stoïcisme au XVIe siècle*, 337-8). Much of this analysis seems sound, except for the final clause : as will be clear from much of the discussion of 'Cartesian anthropology' in this paper, I would fundamentally reject the notion that the domain of the sensible is 'sacrificed' in Descartes' philosophical psychology.

Here once more Cartesian 'anthropology' exerts its influence; for the 'substantial union' of soul and body that constitutes a human being requires, for its survival and well-being, not just intellection and volition, but the whole range of sensory and affective states. All sensory states, as we have seen, are attributable to us not *qua* pure 'thinking things', but *qua* embodied creatures — human beings. And it is clear that many of the psycho-physical correlations involved are crucial for our survival, both as individuals and as a species: that we feel a characteristic kind of discomfort when the stomach is empty and the blood sugar low has obvious survival value in impelling us to eat (and thus relieving the feeling of hunger); that I feel pain when I tread on a thorn has evident utility in encouraging me to avoid such noxious stimuli in future. Nowadays, Darwinian explanations are available to account for the origin of this kind of beneficial sensory monitoring of our bodily states; Descartes, in more metaphysical terms, but with the same implicit functional thesis in mind, invokes the benevolence of God in providing human beings with 'information about what is beneficial or harmful for the [human] mind-body composite' (58). The upshot, in the case of the passions, is that we are dealing with a psycho-physical system whose operation has a signal utility for our life and health as human beings; thus, 'the principal effect of all the human passions is that they move and dispose the soul to want the things for which they prepare the body — for example, the feeling of fear moves the soul to want to flee, and that of courage to want to fight, and similarly with the other passions' (59).

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(57) See passage quoted above, note 33. Descartes goes on to observe that 'although some of the passions can be vicious when carried to excess, others are such that the more extreme they are, the better they are. (AT V 135).

(58) Sixth Meditation, AT VII 83 : CSM II 57. The question arises of why animals, too, would not benefit from such apparatus; Descartes seems to believe that their avoidance of noxious stimuli arises purely from a purely mechanical response system, but there are clearly problems with this notion (which seems to make dogs too like insects); for some of the difficulties, see J. COTTINGHAM, *A Descartes Dictionary*, s.v. 'animal'. For a detailed discussion of Descartes' views on the epistemological and functional role of sensory experience, see Ann Wilbur MACKENZIE, 'The Reconfiguration of Sensory Experience', in J. COTTINGHAM (ed.), *Reason, Will and Sensation : Studies in Descartes's Metaphysics* (Oxford : Oxford University Press, 1994).

If the good life is to be a life for human beings, the passions are to be embraced, since their operation intimately related to our human welfare. This is not to say that they are always and uncontroversially good. Because of the relatively rigid way innate physiological mechanisms and environmentally conditioned responses operate, we may become locked into behaviour that lead to distress, misery or harm. The dropsical man feels a strong desire to drink, even when fluid is the last thing his health requires; the young Descartes feels strongly attracted to cross-eyed women irrespective of how far they are worthy of his affection. But the appropriate way to cope with such irrational impulses is not to retreat to an austere intellectualism, nor to suppress the passions, but rather to use the resources of science and experience to try to understand what has caused things to go awry, and then to attempt to reprogram our responses so that the direction in which we are led by the passions corresponds to what our reason perceives as the best option. Despite the alienation of man from nature which Cartesian science often threatens to bring about, Descartes' underlying vision of the human condition is pervaded by a deep optimism. Awkwardly hybrid creatures of pure mind compounded with mechanical body, we are nonetheless, at the level of our ordinary daily experience, intimately aware of a whole range of sensory and emotional responses whose operation, in general and in the long run, is designed to conduce to human fulfilment (60). This is why Descartes insists that 'the pleasures of the body should not be despised, nor should one free oneself altogether from the passions (61). The Christianized Platonist in Descartes acknowledges that 'the soul can have pleasures of its own'; but, that said, he immediately moves to a ringing endorsement of the affective dimension which arises from the inescapably corporeal side to our humanity :

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(59) *Passions*, art 40. Descartes' reflections on the functional role of the passions lead him to some interesting reflections on the psycho-somatic causes of illness and sound health; cf. letter to Elizabeth of May or June 1645 (AT IV 218-21 : CSMK 250).

(60) For the qualifications 'in general' and 'in the long run', compare the discussion in the Sixth Meditation, AT VII 87-90 : CSM II 60-2.

(61) Letter to Elizabeth of 1 September 1645 (AT IV 287 : CSMK 265). Contrast the antihedonistic orientation of the Stoics : *vera voluptas voluptatum contemptio* (Seneca, De vita beata IV, 2).

> The pleasures common to soul and body depend entirely on the passions, so that persons whom the passions can move most deeply are capable of enjoying the sweetest pleasures of this life. It is true that they may also experience the most bitterness when they do not know how to put these passions to good use, and when fortune works against them. But the chief use of wisdom lies in teaching us to be masters of our passions and to control them with such skill that the evils which they cause are quite bearable, and even become a source of joy (62).

The message is one of reconciliation and integration. And the personal integration that is the goal of Descartes' moral teachings is paralleled by the philosophical integration that joins his moral theory to the rest of his system, as branch to stem. By understanding our special human nature, and coming to see how its workings relate both to the operation of the bodily machine and to our rational goals as thinking beings, we can achieve courage to endure, and hope of joy.

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(62) *Passions*, art. 212.

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HISTORY OF PHILOSOPHY QUARTERLY
Volume 12, Number 2, April 1995

LIFE, SCIENCE, AND WISDOM ACCORDING TO DESCARTES

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IF it is true that "the supreme good" of human life is wisdom, then all human endeavors are grounded in the search for wisdom, and all our scientific ventures are oriented by this search.

The letter which Descartes sent to Elizabeth along with the *Principles of Philosophy* defines wisdom as the "firm and powerful resolve to use reason as well as one can and, in all actions, to do whatever one judges to be best."[1] Wisdom grounds and encompasses the other three cardinal virtues, justice, courage and temperance (successors to the Platonic *dikaiosynè*, *andreia* and *sophrosynè*), and through these, "all the other virtues." Although this definition emphasizes the will, the preface to the French edition of the *Principles of Philosophy* stresses knowledge when it defines wisdom as both "prudence in our affairs" and "a perfect knowledge of all things that mankind is capable of knowing, both for the conduct of life" (moral knowledge) "and for the preservation of health" (medicine) "and the discovery of all manner of skills" (mechanics).[2] Neither definition of wisdom follows the view of Plato and Aristotle that the highest form of knowledge is contemplation as the absolute end of human life, desirable *par excellence.* Instead, wisdom here is *useful* knowledge.

We seek knowledge of the truth inasmuch as it enables us to lead our lives in a satisfactory and happy manner. This does not involve merely virtuous behaviour, but also the health of the body and the exercise of a certain mastery or control over the world.

As the search for wisdom, philosophy is the most useful thing there is for the accomplishment of a successful life; it is therefore also "the greatest good that a state can enjoy." As "more necessary for the regulation of our morals and our conduct in this life than is the use of our eyes to guide our steps," "it is this philosophy alone which distinguishes us from the most savage and barbarous peoples, and [...] a nation's civilization and refinement depends on the superiority of the philosophy which is practiced there."[3]

In point of fact, it is possible to "live," and even to live in a more or less human way (which implies a certain morality) "without philosophizing," but it "is exactly like having one's eyes closed without ever trying to open them." One who proceeds blindly, without knowing the whys or hows of life and the world, is a savage or a barbarian, and thus the opposite of one who, by virtue of true knowledge, discovers how he can "*proceed with confidence in this life*."[4]

This article will consider how Descartes revives the ancient idea that philosophy and the study of wisdom as the search for the highest good are identical. His view of philosophy as the supreme element in a culture, and as a most certain guide on the path leading to the happy life, invites a comparison between his way of "proceeding" and the itineraries which other men and women have employed to find wisdom, goodness and happiness. So many locutions in the Cartesian texts echo a long Græco-Christian tradition which presents the truly human or "spiritual" life as a journey, a voyage or an ascension. In the manner of that tradition, these passages evoke the stages along a way or the steps on a ladder, and they underscore the necessity of an initial conversion, without which we could not find the right path, nor discover the conditions of further progress. It seems worthwhile, therefore, to ask whether Descartes' philosophy can be understood as a modern version of Græco-Christian spirituality.

I

Let us begin by paying attention to the beginning of the Cartesian journey.It seems clear that the force which impels Descartes to risk a radical questioning of his convictions is the urgent need for certainty. His desire for wisdom is grounded in his desire to "proceed with confidence in this life," and the wisdom which he desires is characterized by a fundamental and absolute solidity so certain that it can never again be doubted. "My whole aim was to reach certainty— to cast aside the loose earth and sand so as to come upon rock or clay."[5] The starting point of the path to be followed, the direction, the character of the distance to cross and the way of proceeding from stage to stage must be known in advance, at least in its general patterns and its essential characteristics. If we do not know which direction is the right one, for example, the journey will take us further and further away from our goal instead of taking us closer to it. For, "so long as we turn our back on the place we wish to get to, then the longer and faster we walk the further we get from our destination, so that even if we are subsequently set on the right road we cannot reach our goal as quickly as we would have done had we never walked in the wrong direction."[6] It is not always good to "keep walking as straight as [one] can in one direction" because it is not always true that they who never change direction "will at least end up in a place where they are likely to be better off."[7] When it is a question of gaining true and certain knowledge, we can never be satisfied by these sorts of considerations, where probability and chance play a determining role.

An example of the disaster to which perseverance in a wrong direction can lead is seen in the history of philosophy, which is simply a long repetition of false certainties, which are unjustified and masked by the appearance of a series of probabilities.[8] As long as the question of certainty was the only issue which interested Descartes in his rapid glance at the two thousand years separating him from Plato and Aristotle, he could see nothing in that history to augment the knowledge of a well-educated person of his epoch. In fact, for him, those who have followed the path of Plato and Aristotle or their epigones are the furthest from true knowledge, whereas "among those who have studied whatever has been called philosophy up till now, those who have learned the least" are exempt from the mistakes of the so-called philosophers and are thus "the most capable of learning true philosophy."[9]

Descartes is thus the first true philosopher, because he knows where certainty is to be found. Before this true beginning of philosophy, before the discovery of a solid ground and an absolutely certain principle, there was only a false science of the certain and the doubtful. However, the distance between the history of pseudo-philosophy and true philosophy— which is scientific philosophy— demanded and continues to demand a radical conversion of each person who wants to be initiated. We must separate ourselves from a life-style which contents itself with probabilities and plausibilities, in order to enter into the kingdom of that which is solidly established and certain. But how?

The old way of living, which we must renounce, is characterized by what Descartes calls "commonplace and imperfect knowledge" (*connaissance vulgaire et imparfaite*), or an everyday "wisdom" generally possessed "in four degrees."[10] These "degrees" are elements or "means" of this one wisdom, rather than different degrees or levels of which each has its own wisdom. Together, they constitute a sort of knowledge which Plato would have characterized by the word *doxa*. "All the knowledge that we now possess"— that is, all knowledge which has not undergone the conversion to which Descartes wants to lead his reader — is composed of

1) some "notions which are so clear in themselves that they can be acquired without meditation;"
2) "everything we are acquainted with through sensory experience;"
3) "what we can learn by conversing with other people;"
4) "what is learned by reading books [...] which have been written by people who are capable of instructing us well."

Apart from self-evident notions, which Descartes accepts as standing on their own, and sensible experience, which he does not entirely repudiate but which he feels demands critical examination, pre-philosophical knowledge is composed of that which is said and written in the society in which we live. That is to say, it consists of the common opinions of the culture in and by which we are educated. It is difficult to know which books must be read and who might be "capable of giving good instructions" through their books if we can only employ the first two "means." If, on the other hand, we rely on oral and written "conversation" itself to discover which authors might be worthy of confidence, we enter into an hermeneutic circle. This, however, Descartes must exclude, since it consists in criticizing doubtful opinions by means of other opinions which are themselves uncertain. The true philosopher raises himself above the level of the *doxa* of cultivated people and looks for wisdom "incomparably more elevated and more sure." However, because he can neither start to think from nothing, nor begin from the three last moments of pseudo-knowledge, his only support will be the element of "notions which are so clear in themselves that they can be acquired without meditation." This does not imply, however, that he can neglect meditation. On the contrary, he must freely direct his attention to these notions, and assume the responsibility of making a selection of particular phenomena which are solid and revealing enough for the discovery of truth.

The beginning or the principle of discovery of truth is not something which comes to us as chance or "good fortune."[11] It is not an event, drama, meeting or divine grace which wakes us up from dozing or slumber, but rather a decision of our will; not a call which comes to us from outside, but a reversal of consciousness which comes from this consciousness, this thought or this will itself. Thus I reform myself by an autonomous decision which changes the grounds of my thought.

But how can I change myself if I am a prisoner of the *doxa* of my culture? It is my longing for certainty which pushes me to do so. If I let this desire develop to the point where it becomes imperious, if I allow it such a tyranny that nothing else matters either in my life or in the history of cultures, I can only want and decide that the supreme good which I need must be indubitable. And that is my resolution!

If I find it impossible to doubt, I will be saved: the foundations of my life will be secure once I have escaped the domain where nothing is perfectly secure. A hatred of the uncertain, and the anguish of being lost in the quicksands of insecurity seems to have motivated Descartes to find a solid "rock or clay" in which man can root himself. From here, he can raise himself straight up into the sunlight, in the full confidence of bearing his own needed fruits. Instead of mere hope, which prolongs gratitude and wonderment at one's own existence, Descartes chose to save his life through the autonomy of some initial decisions and a legislation which set his thoughts and actions in order.

Everything which allows even the least opportunity for doubt must be abolished in the name of the desire for certainty. Everything written or spoken must be ignored, all advisors and all traditions must be put into parentheses. Doubt must be radicalized, a methodical skepticism embraced, the uncertainty with which all human life is confronted, especially at the end of a culture or tradition, must be exaggerated.

Will we then sink into complete nihilism? As long as we do not find a solid principle, there will be no response to this question. We must simply tolerate the consequences which spring from the initial decision and wager that something solid and sure will emerge from the ocean of doubt in which we are in danger of drowning. Given that in order to find "the rock" I must ignore or repress everything doubtful, the initial decision obliges me to marginalize and even exclude all that does not stand out with obvious clarity. However, because the flow of life cannot be suspended until nihilism is conquered, life itself must be protected from the general doubt which I decreed as the only means of approaching certain truth— if it is at all possible to attain it. Within pure philosophy, however, I must restrict the terrain of all that is said and written, in order to isolate a domain, a little chunk or even just a point of certainty which will allow me to establish myself for good.

The project which results from the initial decision not to trust anything but the unshakable, presupposes two truths which it takes for given, two prejudices the truth of which is neither proven nor evident nor in itself convincing, and which is neither thematized nor made explicit.

The first prejudice says that it is possible to separate the philosophical search for true principles from practical life. In its third section, the *Discourse on Method* goes as far as dividing the existence of the philosopher into two dwelling places: one is the house which is destroyed by the initial decision to no longer believe in anything, in the hope, however, that this house will be replaced by another more well-founded and more solidly constructed edifice. Next to this theoretical site the philosopher has another domicile, a house where he can "live comfortably" while theoretical building is in progress. What is surprising is that this second abode— the abode without a solid foundation— gives the philosopher the opportunity to "live as happily as he could" and that he can do this, on condition that he formulates some rules of conduct, and that his actions conform to them.[12] If it is true that he can live there, and that he can even live there more or less happily, several questions arise. For example: if it is possible to live happily without having acquired certain knowledge, which is sought on the philosophical site, what then is the importance of certain and perfect wisdom? What does it add to happiness? Is it not true that we need philosophy to know how to conduct our lives? Is philosophizing not then an integral part of the life and happiness of the philosopher?

The dualism of the two dwelling places suggests that philosophy does not occupy the abode of life, but that it belongs rather to the dimension of death. On the other hand, we know that it is precisely the quicksand of uncertainty which Descartes hates and rejects as the sepulcher of all truths.

The conversion towards which Descartes invites all those who are afraid of being deceived by other people's opinions, by prejudices of culture, by probabilities and the merely "moral certainties" of common sense, does not involve the whole person, but only theoretical activity. The practice of life, from which philosophical reflection, in his opinion, can isolate itself, continues to let itself be guided by *doxa*, laws, morals, and the pseudo-wisdom of everyday traditions, or in other words by a culture which is formed according to historical contingency.

The decision to abandon all pseudo-certainties leads to a decision which— against all likelihood— creates a gulf between theoretical work and practical life. The necessity of carefully preparing a rationally founded method demands that we know which path we must follow in the absence of true knowledge. To "walk" on this road "with assurance," we must, however, content ourselves with the semblance of certainty which we find in common sense and the merely probable opinions of the culture in which we share. This is why, as long as the philosopher has not attained the final goal of his project, as long as he cannot gather the fruits from the extremities of the branches of the tree of Science, he needs a "provisional moral code."[13] This *morale par provision* is a moral code which, like "a judgement which precedes the definitive sentence,"[14] contains a sketch of a definitive morality, which itself can only be defined after more complete consideration.

The happy life of the philosopher, who is converted to pure theory in its initial form of methodical skepticism, fits the portrait of the honest man of seventeenth century France. Good citizen, good Christian, moderate and avoiding all excess, he follows the moral code of those he considers "the most sensible men" (those therefore who reflect his own tastes and thoughts). He conforms to the expectations of his compatriots, but is yet so concerned for his independence that he avoids, as much as possible, tying himself to promises, vows and contracts. The *first maxim* of provisional and scientifically unfounded morality dictates that the philosopher rely on a series of presuppositions. We can classify these as a) the laws and customs of France, b) the Catholic religion, c) the opinions commonly held by the most moderate and "most sensible people," insofar as these opinions are put into practice and not merely spoken and believed, d) the choice of a freedom which is as uncommitted as possible.[15]

We might ask how the rule, upon which this model is built, is founded. A clear response is given throughout the text of the *Discourse on Method* which abounds in turns of phrases such as these: "I thought it would be most useful" and "[the most moderate opinions] are [...] probably the best." Next to what *seems* to be true to a man like Descartes, come "accepted opinions," which form the basis for the leading of his life. This is thus the complete opposite of what he stipulated as an absolute condition of perfect wisdom, which is the absolute condition for conduct in a philosophically founded life. True, it is not out of the question that the rules, virtues and mores of provisional morality will be seen one day to be identical to the scientific morality which is envisaged as a fruit of the tree of science. Science is not simply pure theory; there is also a science of good and evil. But:

1) Descartes could not know if these two moralities are identical and we will never know, because the projected tree never developed sufficiently. Descartes himself developed mechanics, medicine and scientific morality only in a very fragmentary way, and he admitted in 1647 that he was "ignorant of almost all" the parts of universal science on which "the principal benefit of philosophy" depends.[16] The post-Cartesian history of the tree of sciences, meanwhile, is the history of the surgical interventions which its roots and trunk underwent continuously until recently, when it died.

2) Even if scientifically founded and executed morality did have the same content as provisional morality, there would be a radical difference between them. Definitive morality would be deduced from the principles of Cartesian metaphysics and physics, and thus both its structure and the progression of its rules and virtues[17] would be understood, while doxastic morality would be built on the authority of a particular culture. But furthermore, according to Descartes this latter morality cannot be a morality of the truly happy and good life, since it has not accomplished the principal task of finding the certainty in all things which is inseparable from true wisdom. Morality by provision is the morality of the person still embroiled in anguish. In the face of the dilemma presented by practical living, one makes a virtue of necessity by choosing to conform to the rules of the particular culture in which, by chance, one was educated.

There is a schism between a theory which pretends to be able to retreat to an absolutely certain position removed from practical life, and a life of action which renounces the exigencies of severely critical reason. This seems to be symbolic of the divorce which in most modern philosophers occurs between the theoretical disciplines, including metaphysics, physics, and philosophy of mind, on one hand, and practical philosophy on the other. Perhaps Kant and Fichte alone realized that if a true beginning or principle in philosophy is possible, it will necessarily be both theoretical and practical. The postponement of ethics until the building site of theoretical philosophy is transformed into a solid edifice with specific duties for medicine, mechanics and morality, is co-responsible for practical nihilism. The idea that we will soon complete the construction of a scientific totality has created the illusion that we can cross the desert of a non-justified morality carrying with us only the long *wait* for an indubitable Law, which has not only been proclaimed but also justified by Reason itself. At the beginning of the journey, we cannot know if this Law will prove to be a legitimization of the initial morality or if it will be a radical recasting of it. What should be certain, however, is that it will be grafted onto the scientific corpus, which will soon be applied to all the questions of human life in order to show their utility. In fact, the goal which Descartes sets himself— wisdom which will enable us to enjoy the supreme good— remains an ideal from which philosophical reflection has grown more and more distant as it endlessly digs up the ground to install or change the foundations.[18]

II

This brings us to the *second maxim* of the provisional moral code.[19] The voluntarist character of the provisional morality is here even more clearly evident than in the first maxim, which involved the decision to "obey the laws and customs of my country." For the philosopher embarked on his journey, Descartes stipulates a guiding rule: that he be as firm and resolute as possible in his actions, and that he follow the most doubtful opinions no less constantly, once they have been determined, than if they were very well secured. Since very often practical life does not admit of sufficient time for us to attain certainty in action, our only solution is to take doubtful opinion as certain truth. It goes without saying that this "tenir pour" (take as) which presupposes a decision of the will, cannot be justified by any rational deduction. The logic of Cartesian theory formally condemns making merely probable opinion identical with true and certain theses. Was this not also the great reproach levelled against the Platonic and Aristotelian tradition? In relation to the active life, however, Descartes adopts a methodical rule drawn from the probabilist morality of his time, which he no doubt learned from the Jesuits of La Flèche. In practice, one has to act *as though* a merely probable— and thus doubtful— opinion were a well-founded and certain rule, that is, a normative truth rationally deduced from well-established scientific principles. Obviously it is not this. Instead of a rational argument, and without giving an analysis either of the concept or of degrees of probability, Descartes uses a rhetorical strategy. He leads the reader to believe that the fundamental ethical questions are clarified by the image of "travellers who upon finding themselves lost in a forest, should not wander about turning this way and that, and still less stay in one place, but should keep walking as straight as they can in one direction, never changing it for slight reasons even if mere chance made them choose it in the first place; for in this way, even if they do not go exactly where they wish, they will at least end up in a place where they are likely to be better off than in the middle of a forest." In this way, scientific theory preserves its domain over all that is not certain: but the price of this is that the domain of practical life is dominated by and abandoned to the wars of probability. In order to rid theoretical philosophy of doubt, Doubt had to be crowned king over ethical territory.

Even in provisional morality, however, not everything is doubtful, because there is at least a "most certain truth" which has a methodic character: "When it is not in our power to discern the truest opinions" and in situations where our actions do not permit any delay, "we must follow the most probable [opinions]. Even when no opinions appear more probable than others, we must still adopt some." This truth is grounded in another certain truth which says that one must act in the best manner, or according to the best norm. In the absence of indubitable rules which indicate which actions are good, it is certain that one must choose that uncertain rule which is closest to certainty, that is, the most probable rule. Descartes did not enter into the moralist debates of his time, concerning whether we must always follow the most probable opinion (*sententia probabilior*), or whether we can legitimately follow a merely probable opinion (*sententia probabilis*) even if a more probable opinion exists. He seems to lean towards the second position, but generally makes very little effort to prove the presuppositions of the second moral maxim, which he chose at the beginning of his philosophical explorations. A comparison of his position with the manuals of 16th century scholastic morality would no doubt show that even here, he did not drift very far from the accepted doctrines of his civilized and moderate contemporaries. When he delimits the domain of morality as the field of reasonable choices between probable opinions, he continues a tradition which reserves the strictly scientific method for questions of theoretical philosophy, while abandoning most ethical questions to prudential wisdom. What is typically Cartesian is the voluntarism of decisions and resolutions which have to compensate for the lack of evidence and conclusive arguments.

In fact, the goal of all maxims of provisional morality is to not "remain indecisive in my actions while reason obliges me to be so in my judgements"[20] and this resolution reappears in texts where Descartes discusses the foundations of morality. Thus, in his letter to Elizabeth, dated August 4, 1645, he defines the virtue which encompasses all particular virtues as the "firm and constant resolution to carry out whatever reason recommends," a resolution made "without being diverted by passion or appetite."[21]

In the preface to the *Principles*, Descartes generalizes the maxims of provisional morality which were presented as rules of personal conduct in the *Discourse on Method*. He writes that "a man who still possesses only the ordinary and imperfect knowledge" of pre-scientific wisdom "should try before anything else to devise for himself a code of morals which is sufficient to regulate the actions of his life. For this is something which permits no delay, since we should endeavor above all else to live well."[22] The second maxim is there formulated thus: "so long as we possess only the kind of knowledge that is acquired by the first four degrees of wisdom [that is, pre-scientific knowledge], we should not doubt what seems true with regard to the conduct of life, while at the same time we should not consider them to be so certain that we are incapable of changing our views when we are obliged to do so by some evident reason."[23]

In a letter written on November 20 of the same year (1647), Descartes repeats this doctrine, insisting again upon the role of the will: resolution should compensate for the imperfections of knowledge. Speaking of the goods of the soul, which are the real moral goods, he says that they "can all be reduced to two heads, the one being to know, and the other to will, what is good. But knowledge is often beyond our powers, and so there remains only our will of which we can dispose outright. I do not see that it is possible to dispose it better than by a firm and constant resolution to carry out to the letter whatever one judges best [even if our judgement cannot surpass the level of probability] and to employ all the powers of one's mind in order to acquire adequate knowledge [i.e. in practicing philosophy]. This by itself constitutes all the virtues; [..] it is this which constitutes the supreme good."[24]

Does the methodological rule which is thus formulated characterize only the non-scientific and provisional moral code" which the *Discourse on Method* and the preface to the *Principles* speak of? Or is it also a part of scientific morality which— as a branch of the philosophical tree— should be deduced from metaphysics and physics? Perhaps Descartes, in the course of several years of reflection, realized that the domain of moral questions will never be free of a multitude of uncertainties, and that concrete action must be satisfied with knowledge that is only more or less probable. Risk is essential to all human action; it cannot be abolished by any science or philosophy. We could ask whether this discovery should not constrain Descartes to radically recast his starting points. The concept of wisdom, for example, and the relation which the concept implies between science and life or between logic and philosophically founded morality, seems to demand another analysis than that from which Descartes begins. But let's leave that for now, in order to ask whether the late work of Descartes contains a definitive morality or the fundamental outline of such a morality.

The reply has to be negative, if we agree with Descartes that such a morality, as the highest and most perfect moral code presupposes "a complete knowledge of the other sciences" from which it should be deduced. This "ultimate degree of wisdom"[25] is not developed, although we could consider the *Passions of the Soul* as an integral part of such a moral science, and though from letters we can glean some phrases which seem to contain the raw material for such a science. Thus we can cite the letter of August 1641 to Hyperaspistes, in which Descartes describes the uncertainty which we see on the level of action as something not only inevitable, but also as a reality which we can prove is insurmountable. In response to a first objection from his pseudonymous interlocutor, Descartes writes: "It would indeed be desirable to have as much certainty in matters of conduct as is needed for the acquisition of scientific knowledge; but it is easily proved that in such matters so much is not to be sought nor hoped for."[26] Then he gives the sketch of a double demonstration, one *a priori*, or from the principles of philosophy, the other *a posteriori*, or "by the consequences." Given the perspective of the scientific project, symbolized by the tree of the sciences,[27] we are interested especially in the first proof, which promises us a true deduction.[28] The phrase in which this proof is sketched gives us only the starting point: "This can be shown *a priori*, to wit, from the fact that the human composite is naturally corruptible, while the mind is incorruptible and immortal." The reader can try to reconstruct the argument which is unspoken in this rather enigmatic clue. Descartes does not indicate how the notion of uncertainty is related to the notions of composition and corruptibility.[29] Nor is he able to give us an explicit theory of moral phenomena and the ethical or meta-ethical rules by which they are ruled. He himself recognizes that he knows almost nothing of the three sciences which the branches of the philosophical tree represent;[30] and both the preface to and the last articles of the *Principles of Philosophy* state very clearly that the program of Cartesian theory has not yet reached the point where it is possible to scientifically treat questions of medicine and morality. Even physics has not yet been completed. The only part which has been completed concerns dead material things, not including minerals. But how can we write a moral treatise if we have not even given a philosophy (a physics) of animals and of the human composite?

"But in order to bring the plan to its conclusion I should need to explain in the same manner the nature of all the particular bodies which exist on the earth, namely minerals, plants, animals and, most importantly, man. And then to conclude, I should have to give an exact account of medicine, morals and mechanics. This is what I should have to do in order to give to mankind a body of philosophy that is quite complete." We still need a lot of time, money and work to accomplish this, however.[31]

By the word "exact" in the penultimate sentence of the text quoted, Descartes seems to point to the difference between non-scientific considerations of morality, such as we find in the account of provisional morality and in some epistolary arguments[32] and "the most perfect morality" which should be a well-grounded, exact and evident science. The *Passions of the Soul* is his last effort to ground scientifically the most urgent thing in life, but it is only a fragment of what it would be necessary to know in order to achieve the wisdom which was the goal of the Cartesian undertaking.[33]

The *third maxim* shows that Descartes drew on the neostoic morality of his time, which seemed reasonable to him, since it teaches that we must not want or desire the impossible.[34] He admits that it is not always easy to put the will in accord with reason, but he recommends a spiritual method also inherited from the tradition: oft-repeated meditation in the Ignatian style, but more or less secularized.

The *fourth maxim*, which he gives as a private rule, formulates a condition of true philosophy.[35] Only those who choose to spend their lives cultivating their reason and progressing as much as they can in the knowledge of the truth can rely on the customs and opinions of which the first three maxims stipulate the authority in moral questions. This last maxim is not a sort of appendix for entirely private use. For, as Descartes specifically states, it formulates the pattern from which the first three borrow their indispensable foundation. None of the maxims would have any value if the path of the philosopher did not promise personal knowledge, which would set the autonomy of a self-justifying science in the place of the authorities on which he had depended. In regard to the first and second maxims, Descartes says that he would never have been able to rely on other people's opinions had he not been convinced that he could get to better and more certain judgements, "in case there were any" by the use of his own reason. The third maxim also presupposes the progress of autonomous knowledge, notably in the knowledge of all the true goods, both those which are not dependent on us, and those which — like virtue — are in our power.[36]

According to the criteria of Cartesian science, provisional morality is based on the sands of a "moving earth," without being grounded on "rock or clay."[37] Inasmuch as we must live and act, we must be happy with a base and a path which lack certainty. Because the urgency of an exact and clear science involves delaying a scientific and certain ethics, the philosopher, who is also an honest man, lets himself be guided by impure reason hidden in the mores and opinions of his epoch. Pure and unmixed reason is found only in the domain of theory, which is separated from the concerns of practical conduct. The project of a secure ethics demands long concentration on questions of pure theory, even if it means only taking up the problems of practical life once science has reached completion.

The conversion to pure theory in the name of the project of a certain science of morality, stands in singular contrast to the itineraries drawn up by the European tradition of spiritual guidance. Whereas this latter emphasizes the deepening of the desire for God and the combination of charitable practices and meditations on this charity, the Cartesian philosopher leaves practice to the codes and mores of a more or less civilized society and to the good sense of men without excess. He concentrates on pure theory, well protected against the intrusions of practical and social concerns. Instead of an asceticism modeled after the sufferings of a persecuted just man who sacrifices himself for others, Descartes advocates the asceticism of a utilitarianism motivated by the desire to master the world, conserve health and regulate the conduct of individual and social life in a useful and happy way.[38] The desert of nihilism and the nights of anguish that all spiritual travellers have to cross, are replaced by the methodically regulated experience of a purely theoretical reversal. Through this one can, "semel in vita," put an end to all radical doubt, in order to establish oneself on the unshakable rock of an absolute principle, which is one's own conscience. In fact, the end of insecurity only comes with the discovery that everything that appears clear and distinct to me is guaranteed by the truth of an infinite God. Once we are certain of this, we can concentrate on the path we must follow in order to accomplish the proposed programme by means of the method which is arranged and fixed in advance. All the battles and all the experiences that professionals of spirituality since Plato and Origen have described or stylized, all the meetings, transformations, adventures, sufferings and passions along the path towards wisdom are annulled in one shot by the simple decision to trust only the game of clear and distinct evidence put into order by an understanding which does not accept conjectures or suppositions.

III

After having supposed that the philosopher can live in two separate places at the same time, Descartes clears the way for theoretical opinions. Because I do not want to be deceived, or to deceive myself, I must eliminate everything that can be put into doubt, in order to conserve only that which is so certain that even the most trustful will cannot doubt it. This involves narrowing the field of appearances until we hit upon something which cannot be denied, a thing which can thus resist the infinite capacity of the will to affirm and deny. To be completely rational, this narrowing, undertaken with a view to the decisive discovery of a place or a point where we can finally lay the foundations of a sure and lasting construction, should also be regulated. This is why a *method* and a *logic* precede the search for a fundamental site. Before metaphysics, which Descartes takes to be the most radical part of science, there is thus *logic* or a doctrine of "the method of rightly conducting one's reason and seeking the truth in the sciences."

If we have learned something from post-Hegelian philosophy, and especially from Nietzsche and Heidegger, it is that no logic is innocent, because it is always also an ontology (disguised or not), full of presuppositions about the essence of being which cannot be justified by this same logic. In his reconsideration of Cartesian logic, Heidegger tried to sketch the ontological position which it entails, that is, a specific way of dealing with the world and oneself and a particular mode of existing in philosophizing. But Heidegger himself follows the Cartesian and modern tradition of philosophy insofar as he, too, indefinitely postpones philosophical consideration of the ethical problematic. Still, it should be clear that all ontology is necessarily a fundamental ethics, inasmuch as a position of thought with regard to the mode of being of beings (which is always also a *taking up* and *acceptance* of a position) is also inevitably the taking of an attitude and action on the basis of affectivity and passion. Any onto-logical constellation of a theoretical ensemble shows the profound inspiration of a human totality, and the particular language in which it expresses itself. All philosophy, and especially the operative logic in philosophy (which can, moreover, be considerably different from the logic which is explicitly formulated) is animated by a breath emanating from a source which precedes the schism between theory and affectivity. The true roots of science are also the roots of true morality.

IV

A diagnosis of modern philosophy would have to analyze the fundamental presuppositions of Descartes' logic, which are as much theoretical as affective and practical. In particular, it would be interesting to take up Heidegger's interpretation of the Cartesian corpus in a perspective more open to the original unity of ontology and fundamental ethics. Here, merely a few indications of the hidden morality which seems to have motivated the Cartesian undertaking can be given.

It is possible to put an end to fundamental anguish by a decision not to tolerate the insecurity of our immersion in the social and cultural life of a particular epoch such as we find it without having chosen, wanted, justified, or understood it. To attain security, we can, as much as possible, take cover in the commitments and emotions resulting from this immersion. Then we must count on an entirely private and pure knowledge, as the only way of saving ourselves from the situation of "a man who walks alone in the dark."[39]

Neither the dualism of theory and practice which this choice involves, nor the radicalization of doubt prevented Descartes from devoting his whole scientific endeavor to the sole aim of enabling man to possess the earth like a master. *Mastery* and *possession* constitute the sense of *utility*, which is desired as the most precious fruit of supreme wisdom. The supreme good is thought through the schema of that which is favourable to welfare. The goal of welfare is the universal success of a possession which begins with consciousness possessing itself, and having itself as a mirror, in order later to spread out over the whole finite universe of man and world. The possession of myself by myself extends to the mastery of a legislator who governs himself in giving himself rules which assure the organization of his thoughts and actions. His will is a will to independence. If this autonomy can be called a power, the profound wish of the Cartesian philosopher would postulate an ethics of a will to power.

V

One of the objections which could be made to the rapid and bold sketch presented in this article would be that God plays too large a role in Descartes' metaphysics for us to accept the proposed schema. Descartes emphasizes the contrast between human finitude, and the infinitude of him whom we need at each moment of our existence in order for us to exist and to be certain of that which seems true to us.

In fact, the "thinking me" which is the site upon which the edifice of knowledge must be constructed, incorporates not only a secure intuition about its own essence and existence, but also the indubitable certainty that God exists as the infinite which guarantees the truth of our clear, distinct and evident ideas. In the third Meditation, Descartes identifies this infinite a little too quickly with "a substance that is infinite, independent, supremely intelligent, supremely powerful," and with the creator, the author and the cause of "both myself and anything else that exists." The presence of the Infinite in consciousness is marked by an idea or representation which has so much objective reality that it could only have been placed there by the Infinite itself. In putting this idea in me, God has imprinted his mark on his work.[40]

These quotations abound in expressions which Descartes inherited from the philosophy which developed within the Christian framework. He cites them without feeling the need to justify them by proofs (which could simply indicate that his interest was not sufficiently great to motivate his participation in the battles of natural theology— but let us not press this point). What Descartes retains from the traditional doctrine, however, is not so much a clarification of the original and pre-conscious relation which links man to God, but the certainty that we can progress from this foundation and come to trust in the phenomena and ideas which evidently appear to us. Once in a lifetime, one must be certain that an infinite God is the guarantor of our clear and distinct thoughts. Then, once this universal "insurance company" is established, we can forget the difficult task of formulating the proofs which we needed to prove and secure his existence: it is sufficient to remember the conclusion we attained and the accompanying certainty. The path of metaphysics can be left behind, and the seeker can now dedicate himself entirely to the more concrete and useful sciences: physics and its application to mechanics, medicine and scientific morality.[41] The human task on earth, the conduct of life and everything that is necessary to it, can all be accomplished without having to turn continuously to God as the saviour from finitude's deceptions and blindnesses. From now on, humankind is on its own, and the world is secularized.

And yet, the two last paragraphs of the third *Meditation* do not at all fit with the kind of deism just presented. Of course Descartes himself presents them as a kind of "pause" or "entr'acte," that is, as a text which is found outside the framework or on the edge of the philosophical discourse which he is holding. He also says, however, that the contemplation of God, about which the text speaks, gives us "the greatest joy of which we are capable in this life." In the middle of the six *Metaphysical Meditations*, then, we find a very short "meditation" which has a different status. If it indeed can be called a "meditation," then we are using an homonymous term, since "the contemplation of this all-perfect God" of which we are speaking here, does not obey either the structures of the representation of an idea, or the methodical rules of theoretical research. Descartes is not studying the idea of God here, but he "pauses" and "spends some time" reflecting on the wonder of his attributes. He discloses to us in the first person that he "gazes" "with wonder and adoration" at "the beauty of this immense light, at least so far as the eye of my mind, which is somehow blinded by it, can bear it."[42]

We must "weigh up" and "scrutinize" all the words which Descartes uses here, so that we can draw from the text its very concentrated wealth. By showing another possibility of coming to terms with that which is most perfect, these passages stand out against the way of thinking of scientific discourse. For the sake of brevity, only a few remarks will be made.

1) Descartes states that we should "believe through faith that the supreme happiness of the other life consists solely in the contemplation of the divine majesty," and that "experience tells us in this very moment that this same contemplation, albeit incomparably less perfect, grants us the greatest joy of which we are capable in this life." This statement formulates the highest thesis of ethics, to which all other theses must point as their source and apex.

2) The style of this contemplation is not at all similar to that of methodical philosophical thought such as Descartes conceives it. The passage cited continues the Augustinian tradition, according to which the realm of ideas was encompassed by another intentionality: that of prayer and admiration, of gratitude, hope and adoration. The God of contemplation is not an "insurer" of propositional truth, but a marvel, a dazzling light which we can neither see, nor know, nor understand. But this does not in any way prevent us from recognizing it as God, through the contemplation which grows out of adoration. Although in the *Confessions* of Saint Augustine the conceptual search for truth was still integrated into the body of a long prayer, in the *Proslogion* of Anselm we see that it begins to detach itself, and to adopt a more studious style, while still alternating with prayers within a religious context. Even though the separation of prayer and thought had been effected long before Descartes, we still find in his writings the remainder of the double intentionality of Augustine and Anselm. It can remind us that the ultimate "usefulness" of demonstrative discourse is simply the capacity to direct human conduct towards a sort of happiness which goes beyond the capacities of an ego trapped in the consciousness of a finite world and a finite consciousness.

3) We must return from the end of the third *Meditation* to its centre, where we recognized that the idea of the infinite cannot be a product— dream, projection or idol— of our thought. If it is true that the idea of God does not give us an object of study, but that it dazzles us by its incomprehensibility,[43] then it follows that the Cogito itself is always obscured. The great clarity of the infinite is not captured by an idea which is found next to other ideas in the consciousness, sharing with them a more or less similar status. It cannot be ranked in a totality according to an order of different levels, limits and degrees. The wonder of this so-called idea goes beyond our capacity to understand, and thus shows consciousness that it cannot possess itself, since it finds itself inhabited by a "thought" which is too big, too strange and too enigmatic to be an idea. In this, the enigma bears a singular resemblance to the Platonic idea of the Good, which is not an idea either. Being neither the sun nor the light, but rather something like the non-visible and untouchable source from which all light and affectivity come, it is responsible for the fact that we can experience all the wonders of the universe, and recognize them for what they are.

In the light of this transcendence, consciousness cannot remain a gaze which thematizes the infinite, as if the infinite were a simple object before consciousness. It must rather change itself in bending or tilting its thought before that which is absolutely other than all direct and objectifying thought. Surprised by the Other, consciousness does not simply abandon its desire to master and possess the world, but, being delivered from anguish by recognition, it becomes respondent and responsible rather than will to originality.

We know how Emmanuel Levinas concretized his reading of the Cartesian idea of the infinite in showing how the Other approaches us, starting from the trace that the infinite left in the course of its passage. While refusing the idea of an "arrière-monde," a *Hinterwelt* or other-world where things happen which are sublime, but nonetheless analogous to our history, Levinas defied the prohibitions of all postmodern philosophies of finitude. He resumed ties with the quadruple Jewish, Greek, Christian and modern traditions, which put the infinite at the beginning and at the end of all human achievements, but he was able to avoid reducing it to a supreme being, an encompassing totality, or a kind of divinity.

In order to contemplate God, a few contemplative sessions or pious actions are not enough; the only serious manner to recognize the "obscure clarity" of the presence of the Infinite in its absence seems to consist in a concern by which we engage ourselves in the social, cultural and historical reality of the world, starting with a recognition filled with wonder. The Other is then certainly the first being which awakens responsibility, but also my consciousness itself and all natural and cultural phenomena surprise us by their admirable incomprehensibility, whilst giving us a sign of an Enigma which can neither be assured, nor can assure. The road to the heights of otherness promises us a meaning less clear but more deep than that of thought.[44]

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Received November 29, 1993

NOTES

1. *Oeuvres de Descartes*, eds. Charles Adam & Paul Tannery (Paris: Cerf, 1897-1913), cited as AT, IX B, p. 21; for the English translation of Descartes, I have used *The Philosophical Writings of Descartes*, trans. John Cottingham, Robert Stoothoff and Dugald Murdoch, Cambridge: Cambridge University Press, 1985, cited as *PW*), although I have sometimes modified their versions of the text. Cf. PW I, p. 191.

2. *AT IXB*, p. 2; *PW I*, p. 179.

3. *AT IXB*, p. 3; *PW*, p. 180.

4. *AT VI*, p. 10; *PW*, p. 115.

5. *AT VI*, p. 29; *PW I*, p. 125.

6. From the preface to the French edition of the *Principles*, *AT IXB*, pp. 8-9; *PW I*, p. 183.

7. A well-known phrase, in which Descartes, in the *Discourse on the Method* tries to justify the probabilist character of his provisional morality. The fact that Descartes defends the indispensable role of probability in the realm of practical life while excluding all uncertainty in the realm of theory, shows the price he was willing to pay to satisfy his desire for theoretical certainty. (*AT VI*, pp. 24-25; *PW I* p. 123).

8. *AT IXB*, pp. 6-9; *PW I*, p. 181-83.

9. *At IXB*, p. 9; *PW I*, p. 183.

10. *AT IXB*, pp. 4-7; *PW I*, pp. 181-82.

11. Literally "a happy part," (*une part heureuse*), which almost sounds like a translation of the *theia moira* which Plato discusses, *Politeia* 493 a 1; *Phaidros* 230 a 6 and 244 c 4; *Nomoi* 931 e 6 and 946 b 3.

12. *AT VI*, pp. 22-23; *PW I*, p. 122.

13. *AT VI*, p. 22; *PW I*, p. 122.

14. Cf. *Petit Robert* s.v. "provision" II, where a *jugement par provision* is explained as "un jugement préalable à la sentence définitive."

15. *AT VI*, pp. 22-24; *PW I*, pp. 122-23. Cf. also what Descartes says about Seneca in his letter of 18 August 1645 to Elizabeth, *Oeuvres philosophiques* (ed. F. Alquié), vol. III, Paris, Garnier 1973, pp. 592-98.

16. *AT IXB* p. 15; *PW I*, p. 186. Although Descartes admits here that he is "ignorant of almost all of [the sciences]" which constitute the branches growing out of the trunk of physics (moral philosophy, incidentally, must also be based on physics), he contributed three fragments of these sciences. In 1637, along with the *Discourse on the Method*, which contains a scientific logic and a non-scientific morals, he published the *Optics*, the *Meteorology*, and a treatise on *Geometry*. The fact that he had not published the sections on scientific morals seems to be a very clear confession of sorts. In his letter of 15 June 1646, to Chanut (*PL* p. 196), he indicates, however, that the *Passions of the Soul* involves an intimate relation — as presupposition or as part? — with the science of morality: "I am spending some time also on thinking about particular moral problems. Last winter, for instance, I sketched a little treatise on the nature of the Passions of the Soul." In the same letter, he draws a link between moral philosophy and physics: "I must say in confidence that what little knowledge of physics I have tried to acquire has been a great help to me in establishing sure foundations in moral philosophy. Indeed I have found it easier to reach satisfactory conclusions upon this topic than on many others concerning medicine."

17. Cf. *AT IXB*, p. 2; *PW I*, p. 179: The knowledge which man needs "for the conduct of life" is put on the same level as knowledge concerned with "the preservation of health" (medicine) and "the discovery of all manner of skills" (mechanics). In order for this knowledge to be perfect enough to be component of wisdom, "it must be deduced from first causes," that is, from the principles of metaphysics and physics.

18. To what extent does the project of a "most perfect moral system, which presupposes a complete knowledge of the other sciences and is the ultimate degree of wisdom" (*AT IXB*, p. 14; *PW I*, p. 186) contain a comprehensive casuistry, as Guéroult thinks [*Descartes selon l'ordre de la raison* (Paris: Aubier, 1968^2) vol. II, pp. 219-71]? The parallelism with the other two branches of the physico-metaphysical tree, and especially a comparison with the fruit which Descartes expects mechanics to bring forth, seem to suggest that a scientific moral system would at least contain a body of rules concrete enough to be useful to those who hesitate between the ethical alternatives of human conduct. The fact that few of these alternatives allow for entirely certain judgements does not eliminate the possibility of determining degrees of probability. Scholastic morality of the time (of which we

can glean an idea, though it is rather a caricature, from Pascal's *Lettres Provinciales*) was dominated by the confrontation of probable opinions, with the search for a method to escape the uncertainty created by the divergence of these opinions. A comparison of probabilist ethics, which Descartes certainly knew, with the moral maxims which he gives in the *Discourse on the Method*, his letters to Elizabeth, and the preface to the *Principles*, would no doubt show that Descartes is rather unoriginal on this subject. Here again, he follows the opinions of the most moderate authors of his time.

19. *AT VI*, pp. 24-25; *PW I*, p. 123.

20. *AT VI*, p. 22; *PW I*, p. 122; Cf. *AT VI*, p. 24; *PW I*, p. 123: "My second maxim was to be as firm and decisive in my actions as I could...."

21. *AT IV*, p. 262. ;*PL* [(English translation of Descartes' letters from *Philosophical Letters*, trans. and ed. Anthony Kenny (Oxford: Clarendon Press, 1970) cited here as *PL*)], p. 164.

22. *AT IXB*, p. 13; *PW I*, p. 186.

23. *AT IXB*, p. 7-8; *PW I*, p. 182. Cf. also at the same page: "Some of those [disciples of Plato and Aristotle] who were in favour of doubt extended it even to the actions of life, so that they neglected to employ common prudence in their behaviour."

24. *AT V*, p. 81; *PL*, pp. 226-27 (translation modified). Cf. also the letter to Elizabeth of 15 Sept. 1645 (*AT IV*, p. 287; *PL*, p. 171), where we find a sort of synthesis of the first two rules of the provisional moral code of the *Discourse on the Method*: "one must also examine in detail all the customs of one's place of abode to see how far they should be followed. Though we cannot have certain proofs of everything, still we must take sides, and in matters of custom embrace the opinions that seem the most probable, so that we may never be irresolute when we need to act. For nothing causes regret and remorse except irresolution."

25. *AT IXB*, p. 14; *PW I*, p. 186.

26. *AT III*, p. 422; *PL*, p. 110 (translation slightly modified).

27. *AT IXB*, p. 14; *PW I*, p. 186.

28. According to the same passage (*AT IXB*, p. 13; *PW I*, p. 185), the scientific character of a philosophical discipline consists in the fact that its truths are "deduced" "by very evident reasoning" from very clear and evident principles.

29. Compare this text to Descartes' letter of September 1, 1645 to Elizabeth. He distinguishes there between two sorts of pleasure and insists on the confusion which characterizes the pleasures of the spirit, inasmuch as it is joined to the body (*AT IV*, p. 262; *PL*, p. 168).

30. *AT IXB*, p. 14; *PW I*, p. 186.

31. *AT IXB*, p. 14; *PW I*, p. 188. The same self-criticism is found in the *Principles of Philosophy* IV, n. 188 (*AT IXB*, p. 315; *PW I*, p. 279): "Up till now I have described this earth and indeed the whole visible universe as if it were only a machine of which one should consider nothing else than the shapes and movements of its parts." As a kind of appendix, Descartes then provides a rapid theory of the objects of our senses (nn. 189-206), on the basis of which he claims "that there is no phenomenon in nature which I have omitted to consider in this treatise," and that he has "proved that the entire visible or sensible world contains nothing apart from the things I have given an account of here" (n. 199, *AT IXB*, p. 317-18; *PW I*, p. 283-84). Even were we to admit this, the fact remains that Descartes did not treat the human composite as such.

32. Descartes' letter of September 15, 1645, written to Elizabeth (*AT IV*, pp. 287ff; *PL*, p. 171-74), gives several examples of moral prescriptions which should find a place in a scientific moral system, but which are not methodically grounded. A first norm tells us to love God and to "accept calmly all the things which happen

to us as expressly sent by God." A second orders us to take care of our soul above all, and to scorn death and chance. Another norm, also very fundamental but neither obvious nor proved, says that "the interests of the whole, of which each of us is a part, must always be preferred to those of our individual personality— with measure, however, and discretion."

In his letter to Elizabeth of August 4, 1645, Descartes criticizes Seneca, not because Seneca was mistaken in the content of the principal norms of a normative ethic, but because he did not ground them sufficiently: "... it seems to me, Seneca should have taught us all the principal truths whose knowledge is necessary to facilitate the practice of virtue and to regulate our desires and passions, and thus to enjoy natural happiness. That would have made his book the finest and most useful that a pagan philosopher could have written" (*AT IV*, p. 262; *PL*, p. 166). By "pagan philosopher," Descartes means, "a philosopher ..., unenlightened by faith, with only natural reason to guide him" (p. 164), a philosopher then like Descartes himself, who claims that he can completely abstract from his faith and Christian theology.

Descartes' distinction between a morality which is correct but not scientifically grounded, and moral science explains why, in the same letter, he distinguishes between "solid contentment," which springs from a real knowledge of the good, and the contentment which is the result of a resolution grounded in an uncertain judgement which is better than other uncertain judgements. Having reminded us of the rule that we must let ourselves be guided by that which seems true or probable to us at the moment of action, Descartes sketches the project of moral science as a condition of "the greatest happiness" — and thus of perfect wisdom — which is the goal of the whole Cartesian revolution. "It is not necessary that our reason should be free from error; it is sufficient if our conscience testifies that we have never lacked resolution and virtue to carry out whatever we judge the best course. So virtue by itself is sufficient to make us content in this life. But virtue unenlightened by intellect can be false: that is to say, the will and resolution to do well can carry us to evil courses, if we think them good; and in such a case the contentment which virtue brings is not solid." On the contrary, "the right use of reason... by giving a true knowledge of good, prevents virtue from being false; by accommodating it to licit pleasures makes it easy to practice; and by making us know the condition of our nature sets bounds to our desires. So we must recognize that the greatest felicity of man depends on the right use of reason; and consequently that the study which leads to its acquisition is the most useful occupation one can take up" (p. 166).

In the same way, section 49 of *The Passions of the Soul* notes a "great difference between the resolutions which proceed from some false opinion and those which are based solely on knowledge of the truth" (*AT XI*, p. 368; *PW I*, p. 347). This distinction sheds light on the phrase already quoted from the *Principles*, where Descartes extols the utility of his philosophy, arguing that "the study of philosophy is more necessary for the regulation of our morals and our conduct in this life than is the use of our eyes to guide our steps" (*AT IXB*, p. 3; *PW I*, p. 180). The same distinction appears in the context of differentiating three levels of consciousness, characterizing them thus: 1) "living without philosophizing," which is a way of "having one's eyes closed without ever trying to open them;" 2) having one's eyes closed and following the conduct of someone else (if we think of the authority which Descartes gives to the "laws and customs" of his country, this level seem to be that of provisional morality); 3) "using one's own eyes to get about," which corresponds to moral conduct grounded in the certain, and hence scientific, knowledge of truth.

33. Cf. the letter of June 15, 1646 to Chanut: "...what I have written is only distantly connected with moral philosophy...;" "the safest way to find out how we should live is to discover first what we are, what kind of world we live in, and who

is the Creator of this world, or the Master of the house we live in. But...there is a very great distance between the general notion of heaven and earth, which I have tried to convey in my *Principles*, and the detailed knowledge of the nature of man, which I have not yet discussed. However, I must say in confidence that what little knowledge of physics I have tried to acquire has been a great help to me in establishing sure foundations in moral philosophy.... So that instead of finding ways to preserve life, I have found another, much easier and surer way, which is not to fear death, without, however, being depressed about it." "I am spending some time also on thinking about particular moral problems. Last winter, for instance, I sketched a little treatise on the nature of the Passions of the Soul..." (*AT IV* p. 440; *PL*, pp. 195-6). Cf. note 16.

34. *AT VI*, p. 25-27; *PW I*, p. 123-24. The same rule is given in letters to Elizabeth (*AT IV*, p. 262; *PL*, p. 165); and to Christine (*AT V*, p. 81; *PL*, p. 226); and in the *Passions of the Soul*, art. 146 (*AT XI*, p. 439; *PW I*, p. 380).

35.*AT VI*, pp. 27-28; *PW I*, pp. 124-25.

36. Understood in this way, the fourth maxim of the *Discourse on the Method* bears a resemblance to the first rule of morality which Descartes gives in his letter of August 4, 1645 to Elizabeth (*AT IV* p. 262; *PL*, p. 168), that one should "employ one's mind as well as one can, to know what should or should not be done in all the circumstances of life." In both cases, the distinction Descartes makes between the path of science and the conduct of one's life, poses difficulties. The third rule in the letter corresponds to the third maxim of the *Discourse*; but the maxim which is second in the letter, and which insists on the autonomy of reason in relation to the passions and appetites, has no counterpart in the *Discourse*. We can only say that the second maxim in this latter work also discusses firmness of resolution. The first maxim of the *Discourse* has no parallel in the letter cited, although the problem of a critique of common opinions and customs which this maxim inevitably poses, is touched upon in the remarks which another letter makes, in the context of what Seneca wrote in the first chapter of his *De Vita Beata*. Cf. also the letter to Elizabeth, Aug. 18, 1645 (see note 15).

37. *AT VI*, p. 29; *PW I*, p. 125.

38. *AT VI*, p. 62; *PW I*, pp. 142-43: "and thus to make ourselves, as it were, lords and masters of nature." Research on the frequency of the words *power*, *to have*, *possession*, *certainty*, *assurance*, etc., and on the power these words wield in Cartesian texts, would no doubt reveal the practico-theoretic motivation which is behind the Cartesian project.

39. *AT VI*, p. 17; *PW I*, p. 119.

40. *AT VII*, pp. 45-46; *PW II*, p. 31.

41. Cf. Descartes' response to an objection to the sixth Meditation in *Entretien avec Burman* (ed. Ch. Adam), Paris, Vrin 1975^2, p. 74.

42. *AT VII*, p. 52; *PW II*, p. 36 (translation modified).

43. Cf. *AT VII*, pp. 45-46, *PW II*, pp. 31-32; *AT IX*, p. 89, *PW II*, p. 61; *AT IXB*, p. 33; *PW I*, p. 236; *PL*, pp. 8-12; *PL*, pp. 171-74 and 208-18.

44. This essay is part of a larger research project on the relationships between philosophy and human life. The original manuscript was written in French and presented at a Descartes Conference on November 24, 1987 in Luxemburg. I want to thank Catriona Hanley, who translated the manuscript into English and added the references to the English translations of Descartes' texts.

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